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Editorial

The biannual journal 'Business Studies', being the mouthpiece of the Commerce Department, Calcutta University, presents research papers in the field of finance, economics, accounting and management within the realm of commerce and business. In keeping with its tradition, this combined 31st and 32nd volume of *Business Studies* contains thirteen insightful papers on diverse contemporary themes ranging from economic growth and human development to capital market dynamics, social and environmental issues to land acquisition problems, and financial reporting aspects of business. The papers have been arranged in order of the perceived link in their contents so as to retain the universal appeal of the research volume. The first paper examines the disparities in economic growth and human development across states of India during reform period, and also investigates the crucial explanatory factors behind inter-state disparities in human development through an empirical study. In continuation of the context of financial reforms, the second paper inquires whether financial globalization and other deregulating measures have any impact on capital market volatility under perfect and imperfect information situations by way of a model building exercise. Our focus shift to the capital market phenomenon in the next five papers. Using standard econometric tools, the third paper investigates the existence of long memory property in Indian stock market based on two leading indices – SENSEX and NIFTY. The fourth paper empirically examines the extent of capital formation through primary market in India during post reform period in special reference to non-government public limited companies. In the context of primary market issues, the role of merchant banks cannot be undermined. Accordingly, the fifth paper evaluates and compares the financial performance of a few selected commercial and development banks engaged in merchant banking activities in India over a five year period. Mutual funds are a prominent class of investors in Indian equity markets today. So, the sixth paper examines the performance of diversified equity funds in India, with special emphasis on some select schemes of HDFC Asset Management Company, while the seventh paper analyses and compares the performance of exchange traded funds and index funds in India in an empirical study. The eighth paper diverts our attention to a social issue and surveys the status of gender equality among some select corporate houses in Kolkata. Being the sole paper in the field of accounting and reporting, the ninth paper deals with the embedded problems of segment reporting in the light of various accounting standards. The tenth paper provides a conceptual overview of carbon credit and carbon trading and sketches the present Indian scenario, and the eleventh paper makes a study of recent trends of clean development mechanism in India and hence turn our attention to environmental context of business. The twelfth and thirteenth papers reorient our focus to economic issues by respectively dealing with the land acquisition problems in India and its solution, and the role of self help groups in enabling financial inclusion in West Bengal.

We sincerely hope that all the articles published in this edition of the Departmental journal will be of keen interest to our valued readers, and will enrich their knowledge base and stimulate their intellect. We would also encourage you to participate in the ongoing debate on the above and other related research themes in the field of accounting, finance, economics and management by contributing your research work to this journal.

Tanupa Chakraborty
Associate Editor

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Inter-State Disparities in Economic Growth and Human Development in India during the First Decade of Reform

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Abstract: This paper is a modest attempt to examine the nature of the disparities in economic growth and human development across the states of India especially during the first decade of reform. It tries to provide answer to the paradoxical situations of the achievement of high rate of growth of real (PCI) coupled with lower level of human development across the states such that while the inter-state disparity in the growth rate of real PCI is increasing, the same in respect of human development is declining during the period of liberalization. We also investigate the crucial explanatory factors behind the inter-state disparities in human development. We find that the social sector expenditure of centre and states especially the expenditure on health and education is abysmally low which is pernicious to economic vis-à-vis human development. The policy of liberalization has failed to produce any impact on it. Further, almost all the states excepting Bihar, Haryana, Punjab, and Rajasthan have been able to raise the annual rate of growth of real per capita income. However, the inter-state disparities in the levels and growth rates of real PCI are very high and it is increasing. Our cross state regression results confirm that the social sector expenditure (SSE) made by government and private household (using PCI as surrogate of private SSE) together explain a significant proportion of inter-state disparity in human development and these two are found to be statistically highly significant explanatory factors.

Key-words: Human capital, economic growth, social sector expenditure, inter-state disparity, real per capita income, cross-state regression.

1. Introduction

Immediately after the emancipation of our economy from the British colonial power, the overall objective, as proclaimed by Pundit Nehru, was the ending of poverty, ignorance, diseases and inequalities in opportunities. In fact, we aimed at such an economic development which would bring about amelioration in the qualities of life vis-à-vis human development. By this time 64 years after independence have elapsed and of course our economy has not remained stagnant. Our economy has been able to rank her amongst the ten fastest growing countries in the world. Being much more optimistic, the 11th five year plan has targeted an annual average growth rate of 8-9% of our GDP. Moreover, we have been able to reduce the proportion of our total population lying below the poverty line to 26%. Further, we have also been able to increase our literacy rate to 65% and our life expectancy at birth to 64 years. Contrary to this optimistic scenario, the most disappointing picture is that we spend an abysmally low proportion i.e.1.22% of GDP on health and water supply and only 3.35% of GDP on education, sports and youth welfare even at the beginning of the 21st century. Surprisingly until now, about 78% of pregnant women of our country suffer form anemia and 58% children suffer from malnutrition and the infant mortality rate is still very high i.e.71 per thousand live births as compared to other countries. The proportion of low birth weight babies is 33% now. All these of course imply a fragile state of health as an important component of human capital. So how can one reconcile between these two completely different (optimistic and pessimistic) scenarios. Is it due to the paucity of flow of public fund to the social sector development? Or is it due to the lack of private expenditure on health? In fact, human development means the amelioration of the ingredient of human capital like education, health, family welfare and qualities of life, which is possible not only through the increase in the flow of social sector expenditure (SSE) by the government but also by the increase in private expenditure on education and health. So one has to make an in- depth study on the nature of human development and its proximate explanatory factors.

By this time we have also experienced several policy changes particularly since 1991, i.e. we have switched over from the state of bureaucratic control over trade investment and finance to the state of widespread deregulation i.e. to market in view of globalizing our economy. But what is surprising is that at the cross country level our economy ranks 127 in respect of Human Development Index (HDI) as per the estimate of UNDP. Thus the paradox is that while in respect of growth we rank amongst the ten fastest growing countries in the world, but in respect of human development (HD), we rank 127 amongst the countries in the world. In fact, one may think of two-way causalities between economic growth and human development as well as the development of qualities of life. The economic growth may lead to a sustained increase in real per capita income thereby leading to the improvement in human capital through increase in expenditure on social services by both the government and private households. On the other hand, improvement in human capital may sub serve the acceleration of physical capital through increase in income and saving. So the obvious question is- do these causalities between the two work? Further, it is also recognized not only in the neoclassical growth theory but also in the modern growth theory, that human capital plays a vital role in the growth of every economy (Solow, 2000; Mankiw et al, 1992; Barro, 1991; Barro and Martin, 1995). In fact, in the study on cross-country differentials in the real per-capita SDP, the human capital viz. education and health has been found to be highly significant (Mankiw et al, 1992; Ghosal, 2002). Of course the cross-state differentials in the level of human capital is the outcome of the differentials in the per capita social expenditure i.e. social sector expenditure on education, health etc. undertaken not only by the Government (central and states) but also by the private i.e. by the household as such. The UNDP has also been computing HDI across the countries since a long time so as to exhibit the nature and magnitude of the cross country differentials in the level of human development and it is being published in the form of Human Development Report. Following the same methodology, Government of India and also the state government have also been computing HDI so that one may have a quick appreciation of the nature of the human development taking place across the states of India. Economists have also focused on the regional disparities in the volume of social sector expenditure across the states (Guhan, 1995; Prabhu, 2001). However, there is the dearth of study on the nature of the relation between economic growth, human development and social sector expenditure. A recent study has shown the two way causal relation between human development and economic growth at the inter-state level and tried to examine the nature of convergence by following the standard neoclassical tool of convergence study. This study has found a converging tendency of human development but diverging tendency of economic growth across the states during 1980-2000 (Ghosh, 2006). Astonishingly, a recent study made by Achal Gaur has shown that except education, average deprivation in terms of per-capita SDP and medical and public health has increased significantly in all the states during 1981 to 2002 (Gaur, 2005). Further, he has also shown that economic reform did not produce any cushion against the human deprivation in respect of health across the states. But in none of these studies the natures of relation between human development and social sector expenditure made by both the central and state government and private households and its cross state differentials have received much attention. Since the data available on the expenditure on health, education, family welfare are mainly of the government (central plus state) and data on the private expenditure on such items are hardly available, we concentrate on the role of social sector expenditure made by government on cross state differentials in the human development vis-à-vis economic growth. Further one has to investigate the role of private expenditure on social services (education, health) and its effect on human development. Moreover, one cannot deny that there is causality between social sector expenditure, human development and qualities of life of the people. So one has to investigate the effectiveness of social sector expenditure not only on the human development, economic growth but also on the qualities of life of the people. In none of the studies mentioned above, these aspects have received any attention. Our study is in this direction and it is organized as follows: Section 2 gives an overview on data and methodology, Section 3 presents an analysis of the nature, trend and composition of social sector expenditure, Section 4 focuses on the inter-state disparities in HD and economic growth and also the relation between social sector expenditure, human development and growth, and finally Section 5 gives concluding observations.

2. Data and Methodology

This study is exclusively based on the secondary data available from the National Account Statistics of C.S.O, RBI Bulletin, the Report on Currency and Finance, the Human Development Reports of GOI, Statistical Abstract, C.S.O etc. However, one of the major problems in respect of data that we face is that there is no comparable set of time series data on per capita social sector expenditure incurred by both centre and states and also by the private households across the states. This has created problems in respect of statistical analysis which was expected to be done. Further since the relevant data on the state Assam is not available before us, we exclude Assam from our analysis. So we consider 14 states as our observations. Now to examine the cross state disparities in human development and social sector expenditure (SSE) made by both centre and states and also by the household, we have used the conventional statistical tool coefficient of variation (C.V). However, it is worth mentioning in this context that since the data of private/households expenditure on education, health and other social services are not available, we have used per capita real income (PCI) as a surrogate of expenditure on the same.

Further, to determine the relative importance of the private expenditure and public expenditure on social services in explaining the inter-state disparity in human development (HD), we regress HDI on PCI and SSE, by fitting a log-linear regression model as follows:

$\text{Log } HDI_{it} = a + b_1 \log SSE_{it} + b_2 \log PCI_{it} + ei$

$i = 1, 2, 3 \ldots 14$ states

t = time

e = error term. We estimate the relevant coefficients by applying the OLS method of regression analysis.

3. Trend and Composition of Social Sector Expenditure

In this section, we analyze the nature and behavior of the social sector expenditure (revenue plus capital account) i.e. the expenditure on education, health, family welfare, water supply and sanitation during mid 80's to 1999-2000. Table-1 gives an overview of the social sector expenditure (SSE). It is quite clear that social sector expenditure as % of GDP has occupied an insignificant proportion throughout the period. In fact, we find that while during the later half of 80's the SSE constituted about 7.74% of the GDP, during the reform period it has fallen and remains almost stagnant around 6.9%. If we consider the SSE as the proportion of aggregate public expenditure then we also find that it hovers between 25% and 26% during the 90's. Further, the real PCSSE at 1993-94 prices does not reveal any remarkable increase during the period from 1987-88 to 1998-99. In fact, it has increased from Rs. 623 in 1990-91 to Rs. 890 in 1998-99. Surprisingly, the state's contribution to the total SSE has been found to be significantly larger than the same of the centre. In 1991, the state's share in total SSE was 85.2% and at the end of the 90's it has become 80%.

Table-1: Centre & States Combined Social Sector Expenditure

Year	Social Sector Exp (rev.+capital)		
	As % of GDP	As % of Agg. Pub. Exp.	Per Capita Exp. (Rs.) in 1993-94 prices
1987-88	7.74	25.29	562
1988-89	7.40	25.22	583
1989-90	7.64	25.19	633
1990-91	6.78	24.85	623
1991-92	6.58	24.28	599
1992-93	6.39	24.06	594
1993-94	6.46	24.58	623
1994-95	6.41	25.01	633
1995-96	6.40	25.95	675
1996-97	6.48	27.22	739
1997-98	6.60	26.95	789
1998-99	6.94	27.36	890
1999-00	7.55	27.69	1027

Source: Estimate based on data from *Indian Public Finance Statistics*, GOI, 1995 and 2000-01.

The trend behavior of the SSE (both capital and revenue) as percentage of GDP and also as percentage of total public expenditure as shown in the scatter plot do not also reveal any optimistic picture during the reform period, albeit with we find a rising trend in real per capita SSE by centre and state (see fig. 1 & 2). Thus on the whole what we find is that economic reform has failed to produce any substantial impact on the social sector expenditure incurred by both the states and centre.

Figure 1: Trend behavior of SSE as % of total public expenditure during the period 1987-88 to 1999-00

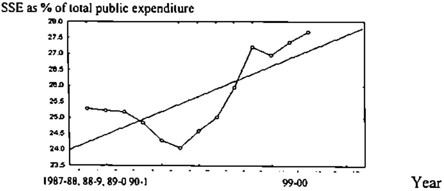
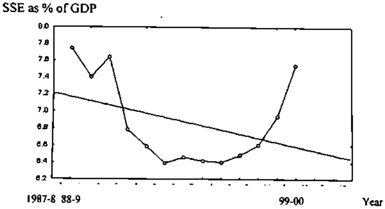


Figure 2: Trend behavior of SSE as % of GDP during the period 1987-88 to 1999-00



Now, so far as the composition of social sector expenditure (central and state government combined) is concerned, the Table-2 gives an overview of the same during the 90's. It is surprising that negligible proportion of GDP has been spent on education, sports and youth welfare throughout the 90s. The figure ranges from 3.06% in 1990-91 to 3.35% in 1999-2000. On the other hand, expenditure on public health and water supply is still found to be abysmally low which hovers between 1.05% of GDP and 1.22% of GDP during 90's. Astonishingly, the expenditure on family welfare is also tremendously low and it ranges from 0.13% to 0.16% during 90's.Now if one considers the expenditure on total social services, the Table-2 clearly reveals that the figure ranges from 5.87% in 1990-91 to 5.85% in 1998-99, and then we find a marginal increase in the same to 6.43% in 1999-2000. What is surprising is that we do not find any increase in social sector expenditure during the period of economic reform. So it is plausible to conclude that the major components of human capital viz the education and health have been neglected even after liberalization. Thus one can safely justify India's position in human development at the cross- country level, which has been estimated by UNDP at 127. Therefore one of the crucial reasons for non-percolation of the fruits of growth mediated economic development (i.e. failure of trickledown theory in our economy) might be the negligence on the formation of human capital. What is more surprising from Table-2 is that the states bear a lion share in all the components of expenditure on social sector, albeit the same has declined marginally from 84.4% in 1990-91 to 82.3% in 1998-99. This obviously implies the delinquency of central government in respect of human development. So what is paradoxical is that, we have liberalized our economy in order to avail of the benefits of market like China, but we pay miserable importance to the development of human capital.

Table-2: Social Sector Expenditure (State-Centre combined) during 90's (as % of GDP)

Major Heads									Share of States (%)	
	'90-91	'92-93	'94-95	'95-96	'96-97	'97-98	'98-99	'99-00	'90-91	'98-99
Education, sports, youth welfare	3.06	2.87	2.76	2.74	2.73	2.78	3.00	3.35	90.3	88.1
Public health and water supply	1.15	1.11	1.10	1.05	1.05	1.11	1.17	1.22	90.7	89.3
Family welfare	0.16	0.14	0.15	0.15	0.13	0.14	0.13	0.15	93.5	85.9
Housing and urban development	0.27	0.26	0.24	0.26	0.34	0.35	0.38	0.45	71.4	44.6
Broadcasting	0.11	0.08	0.07	0.07	0.08	0.08	0.07	0.08	85.7	93.1
Social security and welfare	0.68	0.68	0.63	0.73	0.68	0.70	0.70	0.77	60.3	60.4
Labour and employment	0.13	0.12	0.11	0.10	0.10	0.11	0.10	0.11	92.3	89.2
Other social services	0.31	0.29	0.30	0.29	0.31	0.29	0.30	0.30	18.4	21.2
Total services	5.87	5.55	5.36	5.39	5.42	0.56	5.85	6.43	84.4	82.3
Rural development	0.91	0.84	1.05	1.01	0.88	0.85	0.88	0.91	90.3	64.2
Total	6.78	6.39	6.41	6.40	6.48	6.60	6.94	7.55	85.2	80.0

Source: Computed from the data available in *Indian Public Finance Statistics*, Ministry of Finance, GOI, 1995, and 2001.

4. Inter-State Disparity in Growth and Human Development

In this section we analyze the nature of cross-state variability in the growth of real per capita income and also of the human development, which is measured in terms of human development indices. Table-3 gives an overview on the cross-state disparity in the real per capita income (RPCI) and its annual average growth rates for the three phases viz. (i) 1981-91; (ii) 1991-01 and (iii) 1981-01 and also on degree of variations in the human development across the states. It is evident from the table that the national average rate of growth of RPCI during the Pre-reform period (1981-91) was 3.15% per annum and it has registered an increase during the post reform period (1991-01), the figure being 3.81% per annum. However the growth rate of RPCI for the overall period is found to be much higher (7.09% per annum) than the same for the two phases. So one can safely say that we have achieved a higher growth rate in per capita term during the post reform period.

Table-3: Per Capita Real GDP and its Growth during 1981-2001 at 1980-81 Constant Prices

States	PCI			Annual Compound Growth Rate			HDI			SSE (as % of GDP)		
	1981	1991	2001	1981-91	1991-01	1981-01	1981	1991	2001	90-91	95-96	98-99
Andhra Pradesh	1380	2060	3069	4.09 (2)	4.06 (7)	8.32	.298 (9)	.377(9)	.416(10)	6.92	6.56	6.98
Bihar	917	1197	1225	2.70 (9)	0.23(14)	2.93	.237(14)	.308(14)	.367(14)	8.82	8.34	6.89
Gujarat	1940	2641	4257	3.13 (7)	4.88 (4)	8.17	.36 (4)	.431(6)	.479(6)	6.92	5.02	6.63
Haryana	2370	3509	4485	4.00 (4)	2.48 (10)	6.58	.36 (5)	.443(5)	.509(5)	5.48	6.48	5.82
Karnataka	1520	2039	3590	2.98 (8)	5.81 (1)	8.97	.346 (6)	.412(7)	.478(7)	7.57	6.31	6.29
Kerala	1508	1815	2778	1.87 (13)	4.34 (5)	6.29	.50 (1)	.591(1)	.638(1)	10.7	6.78	6.06
Madhya Pradesh	1358	1693	2084	2.22 (11)	2.09 (12)	4.37	.245(13)	.328(12)	.394(12)	7.45	6.18	7.34
Maharastra	2435	3483	5283	3.64 (5)	4.25 (6)	8.05	.363 (3)	.452(4)	.523(4)	5.44	4.59	4.54
Orissa	1314	1383	1917	0.51 (14)	3.31 (8)	3.84	.267 (10)	.345(11)	.404(11)	9.16	7.92	9.02
Punjab	2674	3730	4897	3.38 (6)	2.75 (9)	6.23	.41 (2)	.475(2)	.537(2)	5.43	4.77	6.07
Rajasthan	1222	1942	2412	4.74 (3)	2.19 (11)	.036	.256 (11)	.347(10)	.424(9)	8.84	8.61	10.65
Tamil Nadu	1498	2237	3643	4.09 (1)	4.99 (3)	9.29	.343 (7)	.466(3)	.531(3)	9.18	6 .4 6	6.96
Uttar Pradesh	1278	1652	1852	2.60 (10)	1.14 (13)	3.77	.255 (12)	.314(13)	.388(13)	7.12	5.55	6.00
West Bengal	1773	2145	3745	1.92 (12)	5.73 (2)	7.76	.305 (8)	.404(8)	.472(8)	7.48	5.14	5.71
India	1630	2223	3234	3.15	3.81	7.09	.302	.381	.472	7.32	5.97	6.37
C.V	31.09	36.0	40.55	37.64	49.33	44.67	22.5	19.02	16.29	35.58	22.1	14

Source: National Accounts Statistics, 2003 C.S.O, Government of India.

Note: Figures in brackets are the corresponding ranks of the state.

It is also discernable from the table that some states viz. Andhra Pradesh, Gujarat, Tamil Nadu, Maharastra and West Bengal for phase (ii) and (iii) have achieved higher growth rate of RPCI than the national average and the others trail behind the same in all the three phases. But what is surprising that there has been a remarkable change in the ranks of the states between the first and second phases. While Tamil Nadu ranked first (4.09% p.a) and West Bengal ranked 12 (1.92%p.a) in respect of growth rates of RPCI during pre-reform period, the rank of Tamil Nadu has been deteriorated to 3 and West Bengal has been able to surmount the barrier and ranked second during the post-reform period by achieving an annual growth rate of RPCI of 5.73%. Tremendous improvement in the rank of Karnataka from 8th to 1st is indeed appreciable. So the table clearly reveals that some of the states like Karnataka, West Bengal, Orissa, and Kerala have been able to bring about a tremendous improvement in their relative positions in respect of growth during the post reform period, but some other states like Tamil Nadu, Andhra Pradesh, Bihar, Haryana etc. have trailed behind. Interestingly, however, the inter-state disparity in the rate of growth of RPCI (measured in terms of C.V) has been found to increase remarkably from pre-reform period to post-reform period. Another interesting trait, which is clear from the table is that majority of the states excepting Bihar, Punjab, Uttar Pradesh, Haryana have been able to increase the rate of growth of RPCI during the post reform period.

Now, if we consider the time – profile of HDI across the states, then it is very clear that all the states have been able to bring about improvement in their human development in varying degrees over the period from 1981 to 2001. The value of national average HDI has increased from 0.302 in 1981 to 0.381 in 1991 and further to 0.472 in 2001. While Kerala has been able to rank first allthrough the period in respect of human development, West Bengal has been able to retain its rank at 8th position, albeit in respect of growth of RPCI Kerala ranks 5 and West Bengal ranks second. So we do not find any one to one correspondence between the ranks in respect of human development and the ranks in respect of growth rates of RPCI. The rank correlation between average growth rate of RPCI during 1991-2001 and the human development indices across the states is very poor for 1991 it is (0.28) and the same is 0.57 for 2001. Further it is also evident that while some states like Tamil Nadu, Kerala, Punjab, Haryana have been able to achieve higher level of human development in varying degrees during the post reform period as compared with the national average level of human development, some other states viz. Uttar Pradesh, Orissa, Madhya Pradesh, Bihar, Andhra Pradesh etc. achieved the level of human development lower than the national average level, albeit they have achieved higher growth rate of RPCI. Astonishingly, the inter-state disparity in respect of human development has shown a declining tendency such that the value of C.V has fallen from 22.5% in 1981 to 19.02% in 1991 and further to 16.29% in 2001. On the contrary, what is more surprising is that the inter-state disparity in respect of growth of RPCI has been found to increase over the period (as is revealed by the time profile of C.V in the table). It is worth mentioning that the study made by M. Ghosh (2006) has also found the same trend. However, if we consider the total expenditure on social services made by the major states (as shown in Table-3), then we find a declining trend in the inter-state disparity in terms of time profile of C.Vs.

But what is surprising in this context is that in almost all the states excepting Rajasthan, the proportion of NSDP spent on social service has fallen during the 90's. So one has to investigate the crucial explanatory factors behind the inter-state disparity in human development. As we have already mentioned that the improvement of human capital consisting of its basic ingredients viz. the education (measured in terms of literacy rate) and health (measured in terms of life expectancy at birth) seems to be the result of both private (household) expenditure on health and education and the public expenditure on social sector/services. So the inter-state variability in the human development seems to be the result of the variability in the SSE by both government and private household. To determine the relative importance of these two types of SSE (public and private), we run a cross-state regression model and regress log (HDI) on log (SSE) by government and log (RPCI) [using it as a proxy of SSE made by private sector] initially without considering any lag in response of the explanatory variables to human development for 1991and then by considering 10 years lag in response on the part of the explanatory factors to the human development for 2001. The regression results are given in table below.

Table-4: Regression Results

Dependent Variable	No. of Obvs.	Constant	Log(PCI-91)	Log(SSE-91)	Adj. R^2	F(2,11)
Log (HDI-91)	14	-3.73 (.543) [.000027]	.7671* (.120) [.000053]	.903* (.194) [.000701]	.7493 (.040)	20.434
Log(HDI-01)	14	-3.19 (.4216) [.000011]	.6591* (.0934) [.00021]	.7686* (.1505) [.000342]	.7875 (.0313)	25.09

Note: figures in first brackets are standard errors and that of third brackets are p-values.

* Significant at 1% level.

Regression results-I clearly indicate that the variations in the SSE of the major states and private expenditure on social services or human capital formation together explain a significant proportion (74% i.e. Adj.R^2 = 0.749) of cross state disparity in the human development in 1991. Both these explanatory factors are found to be statistically significant. Moreover, the regression result-II also reveals that the explanatory power of the two variables viz. SSE by states and the private, have been improved significantly (as Adj. R^2= 0.788) in 2001 such that both of two explanatory factors have been found to be highly significant. It is, however, noteworthy in this context that in regression result-II i.e. for 2001, we have considered 10 years lag in response i.e. values of HDI are for 2001 and those of two explanatory factors are for 1990-91. On the whole, from the regression results one can plausibly conclude that the variations in both of the SSE made by government and private households explain 74 to 79% of the disparity in human development across the states during the period of reform.

5. Concluding Observations

It is well known that immediately after independence, our avowed objectives were the ending of poverty, ignorance, diseases and inequalities of opportunities. By this time 64 years after independence have been elapsed and we have liberalized our economy through the adoption of economic reform. We have indeed been able to rank amongst the 10 fastest growing countries in the world and also to reduce our economic poverty to 26%. But what is paradoxical is that although we have been able to raise our annual average growth rate, RPCI to a very high level (7.09%), our social sector i.e. education and health still remain at very fragile state such that our present literacy rate is 65% and we spend only an abysmally low proportion of 3.35% and 1.22% of our GDP on education and health. Further, although we rank amongst 10 fastest growing economies of the world, our rank in HDI (as computed by UNDP) is 127. So how can one reconcile between the high growth rate and lower level of human development. Moreover there is high level of inter-state disparity in respect of human development, growth rate of RPCI and SSE by government. But what is surprising is that while the inter-state disparities in human development and SSE by states are diminishing during the period of reform, the same for the growth rates of RPCI is increasing. The cross state regression results clearly reveal that variation in SSE under taken by both the government and private households explain a significant proportion 74% to 79% of inter-state disparity in human development. So for the improvement in the level of human development, the public expenditure on social sector should be increased substantially so that the benefits of market can be availed fruitfully like that of other Asian countries viz. China, Hong Kong, Taiwan, South Korea etc.

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Financial Deregulation and Asset Price Volatility under Perfect and Imperfect Information

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Abstract: This paper is intended to focus on the issue of volatility of the capital market in an emerging market economy. The present paper theoretically inquires whether financial globalization and other deregulating measures have any impact on the volatility of the capital market. It accentuates the role of information in this regard to reconcile theoretically the diametrically opposite findings of different studies made in this area. To this end a model based on rational expectation is framed. Expectational difference equation is used as a tool to solve the model. It is found that if information passes freely and perfectly, the volatility of the capital market will remain unaffected, whereas, the imperfectness in information leads to the increase in volatility. So, contrary to the conventional wisdom, the paper concludes that the volatility is independent of the course and the process of deregulation, rather the quality information plays the key role in the determination of volatility.

Key-words: Asset price volatility, rational expectation, globalization, perfect and imperfect information.

1. Introduction

During the last two decades many economies have been progressively deregulating their domestic economic and financial structure and these economies have also made their financial sector open to enable free movement of capital. These deregulating measures have caused precipitous increase in the inflow of external fund in these emerging market economies. Inflow of global fund has fuelled the process of economic growth. The productivity of both capital and labor has increased significantly. As a result, the prices of the domestic assets have increased and so has the possibility of capital gain. It has made the domestic assets very much attractive to the international speculative investors. Private investment has also increased with the financial deregulation. *Henry (2000a)* shows how the equity prices have increased. *Henry (2000b)* analyzes a group of 11 countries and shows empirically that stock market liberalization has a positive impact on the private investment.

But there are some matters of concern as well. With financial liberalization, all types of global portfolio fund are venturing around the world for speculative gain. It is widely believed that making the capital account open would expose the domestic asset market to the volatile portfolio fund and would increase the volatility of the domestic market. In this paper we would like to analyze theoretically how far this conventional wisdom is relevant. The primary quest of this paper is to judge how the financial globalization affects volatility in the asset market.

There has been a long standing debate on this issue. There are scholars who argue that economic liberalization often brings economic instability in emerging economies. *Erturk (2005)* outlined a *'non-imperfectionist'* account of why and how the capital account liberalization can systematically lead to economic volatility even in the absence of market imperfection. He has pointed out that opening of the capital account creates the scope for currency substitution and erratic capital movements across the border. These two factors are intertwined with each other and make the asset price more volatile. *Edwards, Biscarri and Gracia (2003)* after studying six emerging (four Latin Americans and two Asian) market economies (who have liberalized their financial account in early nineties) have found that cycles in these economies tend to have shorter duration and larger amplitude compared to developed countries. That is, the volatility has increased with the financial globalization. They found that after liberalization the Latin American markets behaved more like the developed markets of the advanced economies. However, after liberalization the Asian economies behaved more dissimilarly. So, the financial liberalization does not affect all the emerging economies in uniform manner.

There is a view that financial liberalization results in not only an increase in the volatility of the financial sector, but it also raises the volatility of the real sector. There are a number of authoritative articles in favor of this hypothesis. *Stiglitz (2000)* reviews the arguments in favor of capital market liberalization and identifies their theoretical and empirical weaknesses, and he advocates for intervention in this regard. *Agenor (2003)* provides a selective review of the contemporary analytical and empirical literature on the benefits and costs of international financial integration. The author discussed the impact of financial openness and capital flows on consumption, investment and growth. He also discussed the effect of entry of foreign banks on the domestic financial system. He argues that a small open developing economy may get benefits of financial integration in long run but there are significant risk factors in the short run. He argued that a careful and cautious approach is imperative to prevent any short term policy reversal.

There are articles advocating international financial integration by emphasizing 'risk sharing'. Sharing risk, as they argue, actually reduces variability in consumption growth. *Obstfeld (1994)* develops a continuous-time stochastic model in which international risk-sharing yields substantial welfare gains. He argued that global portfolio diversification results in a shift of capital from a low-yield (safe) to a high-yield ('inherently risky') sector. This provides a continuous array of specialized production inputs, which leads to a continuous increase in the level of welfare through its effect on expected consumption growtth.

Bekaert et al. (2004, 2006) examined the effects of equity market liberalization and capital account openness on consumption growth volatility. They found that countries that have more open capital accounts experience a greater reduction in consumption growth volatility after equity market openings. They also found that financial liberalizations are associated with declines in the ratio of consumption growth volatility to GDP growth volatility. They found that the opening of financial sector for foreign portfolio investment does not raise economic volatility.

Buch et al. (2005) discussed whether the integration of international financial markets affects business cycle volatility. In the framework of a new open economy macro-model, they show that the link between financial openness and business cycle volatility depends on the nature of the underlying shock. They also empirically substantiated the theoretical model to show that the link between business cycle volatility and financial openness has not been stable over time.

However, *Santis and Selahattin (1997)* did not find support for the claim that market integration increases price volatility. *Bhattacharyya (2011)* found that the volatility of the asset market will remain unaffected even after financial globalization in the presence of perfect information. *Jayasuriya (2005)* found that volatility may decrease, increase, or remain unchanged following liberalization. That is according to him it is hard to draw any definite relationship between financial liberalization and asset price volatility.

After reviewing the literature we can hardly find unanimity in the findings of different researchers. Some scholars suggested that financial liberalization raises the volatility of the domestic economy. Some others found diametrically opposite results. It is quite understandable that such a striking difference in the findings is due to methodological differences and due to differences in the cases of study. There are economists, as we have seen, who have argued that it is not possible to derive a unique correspondence between financial globalization and economic volatility. It is the differences in opinion, which have motivated the present study. The present paper is purely a theoretical one and is intended to find the impact of financial globalization on asset price volatility and would like to reconcile theoretically the diametrically opposite findings of different studies made in this regard.

In the existing literature the role of the quality of information during the process of financial deregulation is absent. We have prepared an asset price determination model for an emerging economy. During the process of globalization, the exact course of policy change may or may not be known to the agents, depending on the quality of information prevailing in the economic system of the country. The model calibrated in the present paper intends to encompass the issue of nature of information (perfect or imperfect) in the context of the asset price determination model. This paper intends to develop an analytical framework to show whether opening of capital account introduces any additional volatility into the domestic asset market under imperfect information. Later we would like to compare the case with that of the perfect information. To this end, we calibrate a rational expectation model to observe the effect of liberalization of capital account on the volatility of stock market[1]. As far as the 'tool' is concerned, Rational Expectation based 'Dividend Discount Model' is used and is solved through recursive method.

We see that under perfect information the volatility of the asset price remains unaffected with the policy change, whereas the results differ in case of imperfect information. So, it is not financial liberalization, rather it is the nature of information which is found to be the volatility determining factor. Consequently, it is not unnatural to get completely opposite results unless the nature of information is not considered in the study. This could be one of the plausible explanations of the contradictions in empirical findings of different scholars.

A liberalization measure cannot be once and for all. It is most unlikely that the domestic authority all of a sudden opens all channels of financial flow. Rather, it is a process where the government gradually withdraws the restrictions on the inflow and outflow of foreign capital. The information of the policy change may or may not pass to the agents perfectly. In a democratic system where the political system runs smoothly, it is expected that the decision of financial globalization, like many other socio-economic and political policies, will certainly invite controversy and hence instigate much desired debate among the law makers, social thinkers, economists and most importantly among the common people at all levels of the society. So, prior to the commencement of the program people may get 'adequate' information, if not all, regarding the course and duration of the program, even if the government does not explicitly declare the same. Hence, it would not be very unrealistic to assume that the agents anticipate the policy change and its path. Again, it is also likely that the information may not pass perfectly due to some exogenous shock and the government deviates from the pre-declared policy path, which could surprise the agents. So, both perfect and imperfect information in the context of transmitting information is relevant and cannot be ignored. Similarly, the information regarding the performance of the corporate sector may or may not be transparent enough.

The rest of the paper is organized as follows. Section 2 of the paper will be devoted to framing the model with explicitly stating and analyzing the assumptions. In section 3, we would solve the model for imperfect and perfect information and compare the results of both the cases. In the concluding section, i.e. section 4 we would summarize our findings and results.

2. Structure of the Model

First, we are to determine the price of a risky asset of an emerging market economy, which is gradually deregulating its domestic financial structure, and estimate the volatility of the same under imperfect information. Thereby we would try to focus on the impact of financial deregulation on the volatility of the price of the asset. We would try to compare the case with that of perfect information and draw some important inferences on the issue. In this section we would present the basic structure of the model. The model has been kept as simple as possible to avoid computational difficulties without deviating from the primary focus. Let us first state the assumptions to plinth the model.

1. Let us consider an economic agent, who forms expectation rationally. That is, the agent collects all the necessary information from the existing *information pool* by taking dips to the content, and forms expectation rationally. In that sense, it is a Rational Expectation Model. As we all know, under Rational Expectation economic agents' subjective expectation will coincide with the true value of the objective mathematical conditional expectation i.e. $x_t^e = E(x_t|\Omega_{t-1})$ where Ω_{t-1} is the information set available at period t-1.
2. Let, d_t be the rate of return (dividend) resulting from each unit of the stock (the asset) at period t. Now let it fluctuate around a steady-state growth trend given as,

   $$d_t = a(1+\gamma)^t + u_t \qquad (1)$$

   where, u_t is the cyclical factor and it is supposed to follow a first order autoregressive process AR[1].

   $$u_t = \theta u_{t-1} + e_t^d \qquad (2)$$

   Here, e_t^d is a random element, which follows a white noise process i.e.

   $$E(e_t^d) = 0.$$

$Var(e_t^d) = \sigma_d^2$ (Constant) and

$Cov(e_{t-s}^d, e_t^d) = 0$ if $s \neq 0$.

Let, $|\theta| < 1$. By the virtue of this restriction, we are actually assuming the shock to be stationary i.e. it eventually dies down. Following the basic properties of AR[1] process and due to the assumption $|\theta| < 1$ we can say that, $Var(u_t) = \sigma_d^2 / 1 - \theta^2$ and $Corr(u_t, u_{t-s}) = \theta^s$. So, both the variance and autocorrelation are increasing in θ.

3. Let τ be the 'tax' imposed per unit of inflow and outflow of stock. This 'tax' represents all sorts of impediments and barriers that the agent faces. As stated already, the EME is gradually making its financial sector open. In our model, deregulating financial sector means gradual reduction of τ. The liberalization program is a process and it cannot be once and for all. Hence the gradualist approach thus seems quite reasonable. Let the time path for τ be:

$$\tau_t = \rho^t \tau_0 + e_t^\tau \qquad (3)$$

   Here, ρ is a parameter and is assumed to lie between zero and unity. This ensures the gradual reduction of τ. Now, if the government strictly follows the liberalization program irrespective of any exogenous and endogenous shock, the random component e_t^τ can be dropped. But that would hardly be a realistic assumption. It would be fair to assume $E(e_t^\tau) = 0$.

4. Let us suppose that the process of liberalization starts and terminates at period *0* & *T* respectively.

5. Let us assume that the information transmitted to the agent is subject to "noise" disturbance. That is, the agent receives some exaggerated or précised value of d_t and τ_t, instead of the true values of the variable. If it is thought that information regarding the dividend path (i.e. the path for d) as disclosed by the corporate sector lacks accountability and if due to some exogenous disturbances the course of the government policy (i.e. the path for τ) fails to follow the well-defined pre-declared path, the agent receives information with some "noise". It is also possible that some irregularities on the part of the corporate come into light. This will definitely perturb the trustworthiness of the corporation. The agents might believe that they are receiving distorted information. This will surely affect the process of formation of expectation. Moreover, during socio-political turmoil, which is not rare in these group of countries the government deviates from its pre-declared policy path. The course of policy program becomes uncertain and agents

have to depend on unauthorized sources and rumors. In both the cases, the exact value of the net dividend flow becomes uncertain due to imperfectness of information.

To formalize these features let us introduce a random variable ξ, which is assumed to be normally distributed with mean 1 and a constant variance, σ_ξ^2. That is, $\xi \sim N(1, \sigma_\xi^2)$. When ξ is greater than unity ($\xi > 1$), the agent gets exaggerated information of the values of d_t and τ_t and on the other hand when ξ is smaller than unity ($\xi < 1$) the agent receives précised value of these variables. However, $\xi = 1$ implies perfect information.

Some additional assumptions are required regarding the random variable ξ.

6. Let us assume that ξ_t and u_t are independent to each other, which implies:

$$\left.\begin{array}{l} \text{a. } E_t(\xi_{t+1}.u_{t+1}) = E_t(\xi_{t+1}).E_t(u_{t+1}) = E_t(u_{t+1}) \; [\because E_t(\xi_{t+1}) = 1 \text{ by assumption}] \\ \text{b. } Var(\xi_t.u_t) = \dfrac{\sigma_d^2}{1-\theta^2}[1+\sigma_\xi^2] \end{array}\right\} \quad (4)$$

Proof:

$$\begin{aligned} Var(\xi_t.u_t) &= [E_t(\xi_t)]^2 Var(u_t) + .[E_t(u_t)]^2 Var(\xi_t) + Var(u_t).Var(\xi_t) \\ &= [E_t(\xi_t)]^2 Var(u_t) + Var(u_t).Var(\xi_t) \\ &= Var(u_t)[1 + Var(\xi_t)] = \frac{\sigma_d^2}{1-\theta^2}[1+\sigma_\xi^2] \end{aligned}$$

7. ξ_t and e_t^r are also assumed to be independent. Hence,

$$\left.\begin{array}{l} \text{a. } E_t(\xi_{t+1}.e_{t+1}^r) = E_t(\xi_{t+1}).E_t(e_{t+1}^r) = 0 . \qquad [\because \lim_{t \to \infty} E_t(u_t) = 0] \\ \text{b. } Var(\xi_t.e_t^r) = \sigma_r^2[1+\sigma_\xi^2] \end{array}\right\} \quad (5)$$

Proof:

$$\begin{aligned} Var(\xi_t.e_t^r) &= [E_t(\xi_t)]^2 Var(e_t^r) + [E_t(e_t^r)]^2 Var(\xi_t) + Var(e_t^r) Var(\xi_t) \\ &= [E_t(\xi_t)]^2 Var(e_t^r) + Var(e_t^r).Var(\xi_t) \\ &= Var(e_t^r)[1 + Var(\xi_t)] = \sigma_r^2[1+\sigma_\xi^2] \end{aligned}$$

8. Further, let P_t be the price of a stock that the agent is ready to pay for each unit of an EME stock. The (expected) rate of return of a unit of stock, purchased at the beginning of period t at price P_t and sold at the beginning of period $(t+1)$ at price P_{t+1} has two components: (i) the net (net of 'τ') dividend earned and (ii) the (expected) capital gain. This implies,

$$r = \frac{P_{t+1} - P_t}{P_t} + \frac{\xi_t(d_t - \tau_t)}{P_t}$$

$$or,\ P_t = \left[\frac{1}{1+r}\right][P_{t+1} + \xi_t(d_t - \tau_t)] \tag{6}$$

Here, the expected rate of return, r is assumed to remain constant overtime. Even if we introduce fluctuating expected rate of return the main proposition of the model will remain unaltered. So, to avoid unnecessary computational complications r is taken to be fixed here. In presence of the possibility of arbitrage, r must be identical with the sum of risk free interest and risk premium. Setting $R = \left[\frac{1}{1+r}\right]$ and introducing the expectation operator we have.

$$P_t = R[E_t P_{t+1} + \xi_t(d_t - \tau_t)] \tag{7}$$

This is an *Expectetional Difference Equation* and it owes some explanation. $E_t(P_{t+1})$ stands for expectation of P_{t+1} held at time t. That is, the expectation is formed based on a set of information from all public and private sources at time-t. This information set contains along with many other things all past values of P. d_t and τ_t are exogenous variables. R, the expected return from the stock market is assumed to be constant and considered as a parameter, whose value lies between 0 and 1 in this model.

These assumptions constitute the framework of the model. Following are the propositions of the model

Proposition: I

If the dividend from a domestic stock follows a well defined path with random fluctuation (which follows first order auto regression AR[1]) around it, any process of liberalization, which also has its own path with white noise disturbances, is not going to inject any additional volatility in stock prices, provided the agents behave rationally using all the information they have under a perfect information assumption, irrespective of existence of any speculative bubble.

Proposition: II

Uncertainty regarding the course of policy path and that of the earning from an asset often transmits imperfect information and 'noisy' signals to the agents thereby increasing the volatility of asset price.

3. Asset Price and Volatility under Imperfect Information

Under the set up of imperfect information, the demand price (P_t) of a unit of EME asset becomes

$$P_t = R[E_t P_{t+1} + (d_t - \tau_t)\xi_t] \tag{8}$$

Now let us solve the above problem recursively to find the time path for P_t

$$\begin{aligned} P_t &= R[E_t P_{t+1} + \xi_t (d_t - \tau_t)] \\ &= R[E_t P_{t+1} + \xi_t \{a(1+\gamma)^t + u_t - (\rho^t \tau_0 + e_t^{\tau})\}] \end{aligned} \tag{9}$$

(Substituting the values of d_t and τ_t)

Pushing one period forward we have

$$\begin{aligned} P_{t+1} &= R[E_{t+1} P_{t+2} + \xi_{t+1}\{a(1+\gamma)^{t+1} + u_{t+1} - (\rho^{t+1}\tau_0 + e_{t+1}^{\tau})\}] \\ &= R[E_{t+1} P_{t+2} + \xi_{t+1} a(1+\gamma)^{t+1} + \xi_{t+1} u_{t+1} - \xi_{t+1}\rho^{t+1}\tau_0 - \xi_{t+1} e_{t+1}^{\tau})] \end{aligned} \tag{10}$$

Taking expectation conditional on information at time t in both the sides of the equation and using the relations of 4 and 5 we have,

$$E_t P_{t+1} = R[E_t P_{t+2} + a(1+\gamma)^{t+1} + E_t u_{t+1} - \rho^{t+1}\tau_0] \quad \text{[Assuming, } E_t E_{t+1} P_{t+2} = E_t P_{t+2}\text{]}$$

Substituting the above expression in equation 9 we have,

$$\begin{aligned} P_t &= R[R\{E_t P_{t+2} + a(1+\gamma)^{t+1} + E_t u_{t+1} - \rho^{t+1}\tau_0\} + \xi_t\{a(1+\gamma)^t + u_t - (\rho^t\tau_0 + e_t^{\tau})\}] \\ &= R^2 E_t P_{t+2} + R^2 a(1+\gamma)^{t+1} + R^2 E_t u_{t+1} - R^2\rho^{t+1}\tau_0 + R\xi_t a(1+\gamma)^t \\ &\quad + R\xi_t u_t - R\xi_t \rho^t \tau_0 - R\xi_t e_t^{\tau} \\ &= R^2 E_t P_{t+2} + [R^2 a(1+\gamma)^{t+1} + R\xi_t a(1+\gamma)^t] - [R^2\rho^{t+1}\tau_0 + R\xi_t\rho^t\tau_0] \\ &\quad + [R^2 E_t u_{t+1} + R\xi_t u_t] - R\xi_t e_t^{\tau} \end{aligned}$$

Again pushing one period forward

$$\begin{aligned} P_{t+1} &= R^2 E_{t+1} P_{t+3} + [R^2 a(1+\gamma)^{t+2} + R\xi_{t+1} a(1+\gamma)^{t+1}] \\ &\quad - [R^2\rho^{t+2}\tau_0 + R\xi_{t+1}\rho^{t+1}\tau_0] + [R^2 E_{t+1} u_{t+2} + R\xi_{t+1} u_{t+1}] - R\xi_{t+1} e_{t+1}^{\tau} \end{aligned}$$

Taking expectation conditional on information at time t in both the sides of the equation

$$E_t P_{t+1} = R^2 E_{t+1} P_{t+3} + [R^2 a(1+\gamma)^{t+2} + Ra(1+\gamma)^{t+1}]$$
$$-[R^2 \rho^{t+2}\tau_0 + R\rho^{t+1}\tau_0] + [R^2 E_t u_{t+2} + RE_t u_{t+1}]$$

Again substituting the above expression in equation 9 we have

$$P_t = R[\{R^2 E_t P_{t+3} + R^2 a(1+\gamma)^{t+2} + Ra(1+\gamma)^{t+1} - R^2\rho^{t+2}\tau_0 - R\rho^{t+1}\tau_0 + R^2 E_t u_{t+2} + RE_t u_{t+1}\}$$
$$+\xi_t\{a(1+\gamma)^t + u_t - (\rho^t\tau_0 + e_t^r)\}]$$

$$= R^3 E_t P_{t+3} + R^3 a(1+\gamma)^{t+2} + R^2 a(1+\gamma)^{t+1} - R^3\rho^{t+2}\tau_0 - R^2\rho^{t+1}\tau_0 + R^3 E_t u_{t+2} + R^2 E_t u_{t+1}$$
$$+ R\xi_t a(1+\gamma)^t + R\xi_t u_t - R\xi_t\rho^t\tau_0 - R\xi_t e_t^r$$
$$= R^3 E_t P_{t+3} + R^3 a(1+\gamma)^{t+2} + R^2 a(1+\gamma)^{t+1} + Ra(1+\gamma)^t - R^3\rho^{t+2}\tau_0 - R^2\rho^{t+1}\tau_0 - R\rho^t\tau_0$$
$$+ R^3 E_t u_{t+2} + R^2 E_t u_{t+1} + Ru_t + R\xi_t a(1+\gamma)^t - Ra(1+\gamma)^t + R\xi_t u_t - Ru_t - R\xi_t\rho^t\tau_0 + R\rho^t\tau_0 - R\xi_t$$
$$= R^3 E_t P_{t+3} + Ra(1+\gamma)^t[1 + Ra(1+\gamma) + R^2(1+\gamma)^2] - R\rho^t\tau_0[1 + R\rho + R^2\rho^2]$$
$$+[R^3 E_t u_{t+2} + R^2 E_t u_{t+1} + Ru_t] + (\xi_t - 1)Ra(1+\gamma)^t + (\xi_t - 1)Ru_t - (\xi_t - 1)R\rho^t\tau_0 - R\xi_t e_t^r$$

Proceeding in this way

$$P_t = \lim_{i\to\infty} R^i E_t P_{t+i} + Ra(1+\gamma)^t[1 + Ra(1+\gamma) + R^2(1+\gamma)^2 + \ldots\ldots]$$
$$- R\rho^t\tau_0[1 + R\rho + R^2\rho^2 + \ldots\ldots + R^T\rho^T] + R\sum_{i=0}^{\infty} R^i E_t u_{t+i}$$
$$+ (\xi_t - 1)[Ra(1+\gamma)^t + Ru_t - R\rho^t\tau_0] - R\xi_t e_t^r \tag{11}$$

From equation 2 $u_{t+1} = \theta u_t + e_{t+1}^d$

Now taking expectation conditional on information at time t

$E_t u_{t+1} = \theta u_t$; By repeated substitution we have $E_t u_{t+i} = \theta^t u_t$. Substituting the value of $E_t u_{t+i}$ for each $i=0, 1, 2, 3$..........in11 we find equation 12. Equation 12 happens to be the solution of the problem.

$$P_t = \lim_{i\to\infty} R^i E_t P_{t+i} + \frac{Ra(1+\gamma)^t}{1 - R(1+\gamma)} - R\rho^t\tau_0\frac{[1 - (R\rho)^T]}{1 - R\rho} + Ru_t\frac{1}{1 - R\theta}$$
$$+ (\xi_t - 1)[Ra(1+\gamma)^t + Ru_t - R\rho^t\tau_0] - R\xi_t e_t^r \tag{12}$$

Now, putting $\xi_t = 1$ we have the asset price under perfect information, which may be considered as the *true price of the asset, P**.

$$P_t = P^* = \lim_{i\to\infty} R^i E_t P_{t+i} + \frac{Ra(1+\gamma)^t}{1-R(1+\gamma)} - R\rho^t\tau_0 \frac{[1-(R\rho)^T]}{1-R\rho} + Ru_t \frac{1}{1-R\theta} - R\xi_t e_t^r$$
$$\approx \lim_{i\to\infty} R^i E_t P_{t+i} + \frac{Ra(1+\gamma)^t}{1-R(1+\gamma)} - R\rho^t\tau_0 \frac{[1-(R\rho)^T]}{1-R\rho} + Ru_t \frac{1}{1-R\theta} \tag{13}$$

The transversality condition: $\lim_{i\to\infty} R^i E_t P_{t+1+i} = 0$

The transversality condition actually rules out the possibility of bubble.
Substituting the transversality condition we have the true value of the asset.

$$P_t = P^* = \frac{Ra(1+\gamma)^t}{1-R(1+\gamma)} - R\rho^t\tau_0 \frac{[1-(R\rho)^T]}{1-R\rho} + Ru_t \frac{1}{1-R\theta} \tag{14}$$

This expression owes some explanation. The first term in the right hand side of the above equation is the present value of the future flow of dividend, if it grows along its steady state growth trend. The last component depicts the effect of random fluctuation of the dividend on the price of the stock. We can sensibly assume that the dividend path gets some positive shock when the economy is in upswing and vice versa. It would not be very illogical to think this random component as a pro-cyclical element that fluctuates with the ups and downs of the business cycle, as profit and the rate of dividend fluctuates with the ups and downs of the business cycle. So, whenever the economy is in depression we can expect a negative u_t and vice versa. Another aspect is worth noting here. As $\frac{R}{1-R\theta} > 1$, any random fluctuation in the dividend path, however small it may be, leaves a greater impact on the price of the stock. This actually depicts the over reactive nature of any stock market. The second term shows the present value of the stream of successive 'tax' relives that one overseas investor expects, thanks to the liberalization program.

In the presence of Imperfect Information the time path would become:

$$P_t = P^* + (\xi_t - 1)[Ra(1+\gamma)^t + Ru_t - R\rho^t\tau_0] - R\xi_t e_t^r \approx P^* + (\xi_t - 1)[Ra(1+\gamma)^t + Ru_t - R\rho^t\tau_0] \tag{15}$$

If the information is imperfect the asset price differs from that of the perfect in respect of the noise component. If the agent gets exaggerated value of the dividend and / or policy variable (i.e. $\xi_t > 1$) the $P_t > P^*$. Otherwise, if the agent gets précised or diminished value of the asset (i.e. $\xi_t < 1$) the $P_t < P^*$. Thus we have shown how the imperfectness of information makes the asset price deviate from its true value.

Now let us turn our attention to the variability of the asset price. Taking variance of the true value of the asset in equation (14), we have:

$$Var(P^*) = \frac{R}{1-R\theta}Var(u_t) = \frac{R}{(1-R\theta)}\frac{\sigma_d^2}{(1-\theta^2)} = \sigma_S^2 \ (say)$$

Two points have to be noted from the above expression of the variance of the asset price under perfect information. First, the variance remains constant i.e. it is independent of any endogenous factor. Moreover there is no 'tax' element in the expression of the variance of asset price. This implies that the process of globalization does not affect the variability of the asset price of an EME, provided there is perfect information and rational expectation. This is an interesting outcome as it goes against the conventional wisdom. Generally it is argued that with financial globalization the prices of the assets of an EME become more volatile. Contrary to the conventional wisdom the results categorically prove that globalization of financial account of balance of payments does not inject any additional volatility. Secondly, the variance of asset price is independent of time. Both the findings are, however, true for perfect information.

(Proved, Proposition: I)

As the government starts to withdraw the restrictions on the flow of fund the chances of capital gain increases and the external funds move in. The rise in asset price, withdrawal of restrictions and the expectation for greater capital gain reinforce each other and fresh new portfolio capital comes in. Here we see that if the information regarding the change in policy flows in perfectly to the agents, there is no room for uncertainty and the volatility would remain unaltered.

$$Var(P_t) = Var(P_t^*) + R\sigma_\xi^2\{a(1+\gamma)' + \frac{\sigma_d^2}{1-\theta^2} - \rho'\tau_0 - \sigma_\tau^2\} \qquad (13)$$

Thus we see that under uncertain state i.e. when the information passes imperfectly to the agents, the volatility rises compared to the case of perfect information. Moreover, the variability under the imperfect information is neither independent of the liberalization measures nor it is independent of time. We can say that:

$$\sigma_U^2 = Var(P_t) > Var(P_t^*) = \sigma_S^2$$

(Proved, Proposition: II)

Thus we see that if the information flows imperfectly, uncertainty in the asset market would lead to an increase in the volatility. If the government deviates from the pre-declared and well defined policy path it could inject additional volatility into the system. Again, if the business data published by the corporate is not enough trustworthy, it could also create uncertainty. What we tried to establish is that a rise in volatility after liberalization of capital account cannot be viewed as a result of the liberalization program; it may happen due to inadequate information. It actually infers that if empirical studies are made when the government is maintaining stability in the formulation and execution of policy, one would find a stable financial sector despite financial integration. Again, if the government is found to be weak and hesitant in formulating and executing the policies, there could be rise in volatility in asset market. The volatility in the asset market may also increase due to any exogenous shock, which forces the government to deviate from the policy path. Thus it is not possible to get any definite relationship between financial integration and asset price volatility unless one considers the aspect of information into the analysis.

4. Concluding Remarks

The quest of this paper is to find out how does the process of globalization affect volatility of the asset market in an EME. To this end, we have calibrated a theoretical model under the assumption of rational expectation. While reviewing the literature we find highly conflicting findings of the previous researchers. Some of the scholars found that financial globalization would result into an increase in volatility in the asset market of the EMEs. However, the findings of the some others are diametrically opposite. There are some works which actually try to focus that there could not be any definite relationship between globalization and volatility. Under this theoretical and empirical back drop our paper actually focuses under perfect information the volatility in the asset market will remain unaffected with the globalization. However, if the information flows imperfectly to the agents the volatility in the asset market will surely increase. Moreover, as we find in our model, the volatility of the asset market will increase overtime. Thus we find that it is the nature and quality of information which really matters not the globalization in itself. That is, if the concerned government is able to manage the process of globalization with necessary transparency such that the information passes perfectly to the agents, the possibility of the increase in volatility would be reduced. If the dividend from a domestic stock follows a well defined path with random fluctuation (which follows first order auto regression AR[1]) around it, any process of liberalization, which also has its own path with white noise disturbances, is not going to inject any additional volatility in stock prices, provided the agents behave rationally using all the information they have under a perfect information assumption, irrespective of existence of any speculative bubble. Uncertainty regarding the course of policy path and that of the earning from an asset often transmits imperfect information and 'noisy' signals to the agents thereby increasing the volatility of asset price. What we tried to establish is that a rise in volatility after liberalization of capital account cannot be viewed as a result of the liberalization program; it may happen due to inadequate information. It actually infers that if empirical studies are made when the government is maintaining stability in the formulation and execution of policy, one would find a stable financial sector despite financial integration. Again, if the government is found to be weak and hesitant in formulating and executing the policies, there could be a rise in volatility in the asset market. The volatility in the asset market may also increase due to any exogenous shock, which forces the government to deviate from the policy path. Thus it is not possible to get any definite relationship between financial integration and asset price volatility unless one considers the aspect of information into the analysis.

So, we would like to advocate rule based policy regime, where the government is supposed to follow some pre-declared rule rather than situation based policy. This would help the agent in forming their expectation. The policy of the government is supposed to ensure that the private corporate declare their business statistics in time and in orderly manner. Auditing procedure should be maintained. As we have seen that maintaining perfect information is one of the prerequisites of stability in the financial sector.

End Note

1. Blanchard Oliver Jean and Stanley Fischer (1989), "Multiple Equilibria, Bubbles, and Stability" chapter 5 pp 213-274 Lectures on Macroeconomics. Prentice Hall of India Pvt. Ltd. – has showed a technique to solve the expectational difference equation. We have followed that methodology.

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Long Memory in Indian Stock Market : An Empirical Analysis

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Abstract: This study aims at investigating the existence of long memory property in Indian stock market. We have chosen two leading indices SENSEX and NIFTY as proxy for the same. Standard econometric tests have been used including Rescaled-Range (R/S) analysis and its modified form in time domain and the Spectral Regression Method in the frequency domain. The results indicate presence of short memory in return series and long memory for volatility. The study also found the existence of Taylor's effect in Indian stock market. The findings are consistent in all the tests and are in line with the stylized facts of financial time series.

Key-words: Long memory, rescaled-range analysis, spectral regression method, Taylor's effect, volatility.

1. Introduction

The covert presence of stochastic long memory in stock market returns has been an imperative issue of both theoretical and empirical investigation. It is well known and accepted that some of the human and natural phenomena show long memory and there exists huge publications relating to long memory in areas such as finance (e.g. Lo, 1997), econometrics (e.g. Robinson, 2003), internet modelling (e.g. Karagiannis et al., 2004), hydrology (e.g. Painter, 1998), climate studies (e.g. Varotsos and Kirk-Davidoff, 2006), linguistics (e.g. Alvarez-Lacalle et al., 2006) or DNA sequencing (e.g. Karmeshu and Krishnamachari, 2004). Long range dependence and long memory are synonymous notions that have far reaching implications. Presence of stochastic long memory in stock market returns has a direct impact on the world of market efficiency and can pose a serious challenge to the proponents of random walk behavior of the stock returns. The studies related to long range dependence includes detection of long memory in the data, statistical estimation of parameters of long range dependence, limit theorems under long range dependence, simulation of long memory processes, and many others. Hurst (1951) possibly inspired the development of statistical long-memory processes. He proposed a method (Rescaled-Range analysis) for the quantification of long-term memory which is based on estimating a parameter for the scaling behaviour of the range of partial sums of the variable under consideration. Some early studies in long memory process in finance were carried out by Mandelbrot (1971, 1972) and Mandelbrot and Wallis (1969) who suggested that in the presence of long memory, arbitrage opportunities may exist as new market information cannot be absorbed quickly and martingale models of asset prices may not be justified. Mandelbrot (1997) contains many of the early papers that Mandelbrot wrote on the application of the Hurst exponent in financial time series. Since those days, the application of the long memory processes in economy has been extended from macroeconomics to finance. A good survey of the econometric approach to long-memory is given in Baillie (1996).

The study of possible long-memory properties of time series in finance is even more widespread. There has been a long-standing debate as to whether or not asset prices have long-memory properties. In case of long memory, linear pricing models and statistical inferences about asset pricing models based on standard testing procedures may not be appropriate (Yajima, 1985). Several authors have claimed that the time series of stock returns for stock prices or indices display long-memory (Mandelbrot, 1971; Greene and Fielitz, 1977). Lo (1991) re-examined these results and showed that the statistical Rescaled-Range (R/S) test used by Mandelbrot (1971) and Greene and Fielitz (1977) is too weak and unable to distinguish between long and short memory. By introducing a modified R/S test, Lo concluded that daily stock returns do not display long-memory properties. However, Willinger et al. (1999) showed that the modified R/S test leads to the rejection of the null hypothesis of short-memory when applied to synthetic time series with a low degree of long-memory. Since financial data typically display low degree of long-memory, they claim that the result of Lo (1991) may not be conclusive.

It is more widely accepted (though still not entirely uncontroversial) that the volatility of prices is a long-memory process. It is well known that asset price returns contain little serial correlation, in accord with the efficient markets hypothesis; however, their volatilities exhibit a much richer structure. There is a lot of evidence showing that conditional volatility of returns on asset prices displays long memory or long range dependence. Andersen and Bollerslev (1997), Ding et al. (1993) and Breidt et al. (1998) find evidence of long-memory stochastic volatility in stock returns, and Harvey (1993) finds evidence for this in exchange rates. These results led to the development of alternate models for volatility, such as Fractionally Integrated Generalized Autoregressive Conditional Heteroskedasticity (FIGARCH) model.

In finance, the discussion as to whether or not the stock market prices display long memory properties still continues since this fact has important consequences on the capital market theories. So, if stock prices show long memory this means that predictability is not a dream but a possibility. The main implication of this circumstance is that an efficient market hypothesis is clearly rejected because stock market prices do not follow a random walk. The presence of long memory dynamics in asset prices would provide evidence against the weak form of market efficiency as it implies nonlinear dependence in the first moment of the distribution and hence a potentially predictable component in the series dynamics. It would also raise issues regarding linear modeling, forecasting, statistical testing of pricing models based on standard statistical methods, and theoretical and econometric modeling of asset pricing.

In financial econometrics literature, different power transformations of absolute returns of various financial assets have been found to display different magnitudes of sample autocorrelations, a property referred to as the 'Taylor effect'. Taylor (1986) observed that the empirical sample autocorrelations of absolute returns are usually larger than those of squared returns. A similar phenomena is observed by Ding et al. (1993) and Granger and Ding (1994, 1995, 1996). Granger and Ding (1995) referred this phenomenon as the "Taylor effect" and since then this has been an area of interest in many studies.

This study aims at investigating the existence of long memory property in Indian stock market. Studies in long range dependence in Indian stock market are very limited. Nath (2001) found evidence of long memory property in the Indian stock market using data from BSE500 stock index. We have chosen two leading indices SENSEX and NIFTY as proxy for the same. The study also explores the existence of Taylor effect in Indian stock market.

In the present paper section 2 gives the definition of long memory process. Section 3 consists of the different methodologies used to test long memory process. Section 4 is completely devoted to the data analysis and findings of the paper. Finally, section 5 narrates the conclusion drawn from data analysis and findings.

2. Definition of Long Memory

The long memory describes the higher order correlation structure of a series. If a time series y_t is a long-memory process or exhibits long-range dependence, there is persistent temporal dependence between observations widely separated in time. Such series exhibits hyperbolically decaying autocorrelations and low frequency distributions. Mathematically, if $\lambda_s = \text{cov}(y_t, y_{t+s})$, $s=0, \pm 1, \pm 2, \ldots$, and there exist constants k and α, $\alpha \in (0,1)$ such that

$\lim_{s\to\infty} k\lambda_s s^{-\alpha} = 1$ then y_t is a long-memory process. A long memory process can be regarded as a halfway between stationary and unit root process. Like a stationary process, it is also a mean reverting process with a finite memory, i.e., it comes back to equilibrium after experiencing a shock. But unlike an autoregressive stationary process, it shows a much slower hyperbolic rate of decay rather than exponential, and the process takes much larger time to adjust back to equilibrium. When a time series have unit root at level but its first-differences are stationary, it is said to be I(1) process (integrated of order one). A stationary process is said to be I(0) process (integrated of order zero). Using the same notation, long memory process is I(d) process, where d lies between 0 and 1, i.e., a fraction. Hence long memory is also known as 'fractionally integrated process'. In the frequency domain, long memory financial time series have typical spectral power concentration near zero or at low frequencies and then it is declining exponentially and smoothly as the frequency increases (Granger, 1966).

3. Methodology for Testing Long Memory Processes

The empirical determination of the long-memory property of a time series is a difficult problem. The basic reason for this is that the strong autocorrelation of long-memory processes makes statistical fluctuations very large. Thus tests for long-memory tend to require large quantities of data. In this paper we tested the stationary properties of all the data series using Dickey and Fuller (1979) (ADF) test, Phillips-Perron (1988) (PP) test and Kwiatkowski, et al. (1992) (KPSS) test. We have tried to capture the long memory property of financial data using Rescaled-Range (R/S) analysis introduced by Hurst (1951), modified Rescaled-Range (R/S) analysis introduced by Lo (1991) and the spectral regression method suggested by Geweke and Porter-Hudak (1983). The above tests were applied on return series, absolute return series and squared return series. The referred methods and the definition of long memory are detailed below.

3.1 Rescaled-Range (R/S) Analysis

R/S analysis provides a measure of long range dependence based on the evaluation of the Hurst's exponent of stationary time series introduced by English hydrologist H.E. Hurst in 1951. The Hurst exponent was built on Einstein's contributions regarding Brownian motion of physical particles and is frequently used to detect long memory in time series. R/S analysis in economy was introduced by Mandelbrot (1971, 1972, 1997) who argued that this methodology was superior to the autocorrelation, the variance analysis and to the spectral analysis. Let X(t) be the price of a stock on a time t and r(t) be the logarithmic return denoted by $r(t) = \ln\left(\frac{X_{t+1}}{X_t}\right)$. The R/S statistic is the range of partial sums of deviations of times series from its mean, rescaled by its standard deviation. Hence, if r(1), r(2),... r(n) denotes asset returns and $\bar{r}_n$ represents the mean return given by $\bar{r}_n = \frac{1}{n}\sum_{t=1}^{n} r(t)$, where 'n' is the time span considered, the rescaled range statistic is given by

$$\left(\frac{R}{S}\right)_n = \frac{1}{\sigma_n}\left[\max_{1\le k\le n}\sum_{t=1}^{k}(r(t)-\bar{r}_n) - \min_{1\le k\le n}\sum_{t=1}^{k}(r(t)-\bar{r}_n)\right] \qquad \ldots (1)$$

Where σ_n is the maximum likelihood estimate of sample standard deviation: $\sigma_n^2 = \frac{1}{n}\sum_{t=1}^{n}(r(t)-\bar{r}_n)^2$. The first term in the bracket is the maximum of the partial sums of the first k deviations of r(t) from the sample mean, which is nonnegative. The second term in the bracket is the corresponding minimum of the partial sums, which is nonpositive. Therefore, the difference of these two quantities, called "range" is always nonnegative, so that the rescaled range, $\left(\frac{R}{S}\right)_n \geq 0$. The advantage of the classical R/S analysis is that the results are reliable regardless of whether the distribution of the series is normal or nonnormal. The null hypothesis of the test is that there is no long-range dependence in the series. This test is performed by calculating the confidence intervals with respect to some significance level, and to see whether the rescaled range statistic lies in or outside the desired interval. The critical values for the above two tests are given in Lo, 1991, Table II.

A drawback of the R/S analysis is that its measure of long range dependence is affected by short range dependence that may be presented in the financial data. Hence we consider estimating modified R/S statistic proposed by Lo (1991).

3.2 Modified Rescaled-Range (R/S) Analysis

The modified R/S test suggested by Lo (1991) for long memory examines the null hypothesis of a short memory and possibly heteroskedastic process against long memory alternatives. Lo's modified version of the statistic takes account of short-range dependence by performing a Newey and West (1987) correction to derive a consistent estimate of the long-range variance of the time series. Lo's modified R/S statistic, denoted by Q_n is defined as:

$$Q_n = \frac{1}{\sigma_n(q)}\left[\max_{1\le k\le n}\sum_{t=1}^{k}(r(t)-\bar{r}_n) - \min_{1\le k\le n}\sum_{t=1}^{k}(r(t)-\bar{r}_n)\right] \qquad \ldots (2)$$

where $\sigma_n^2(q)$ is the Newey and West (1987) estimate of long run variance of the series defined as $\sigma_n^2(q) = \frac{1}{n}\sum_{t=1}^{n}(r(t)-\bar{r}_n)^2 + 2\sum_{j=1}^{q}\omega_j(q)\gamma_j$, where γ_j represents the sample autocovariance of order j, and $\omega_j(q)$ represents the weights applied to the sample autocovariance at lag j (1,2,...q). $\omega_j(q)$ is defined as: $\omega_j(q) = 1 - \frac{j}{q+1}$

The second term in the long run variance equation intended to capture the short term dependence. The lag length q used to estimate the heteroskedasticity and autocorrelation corrected (HAC) standard deviation is extremely crucial for modified R/S test of long memory. We have used bandwidth selection procedures suggested by Lo (1991) to find the lag length.

3.3 The Spectral Regression Method

A stationary long memory process can be characterized by the behaviour of the spectral density f(λ) function which takes the form $f(\lambda) \sim c\left|1-e^{-i\lambda}\right|^{-2d}$, as $\lambda \rightarrow 0 \text{ with } d \neq 0$, where $c \neq 0$, d is the long memory parameter (or fractional differencing parameter) and $0 < |d| < 0.5$. In order to estimate the fractional differencing estimator d, Geweke and Porter-Hudak (GPH) (1983) proposed a semi-parametric method of the long memory parameter d which can capture the slope of the sample spectral density through a simple OLS regression based on the periodogram, as follows:

$$\log I(\lambda) = \beta_0 - d\log\{4\sin^2(\lambda_j/2)\} + \upsilon_j, \qquad j = 1, 2, \ldots, M \qquad \ldots(3)$$

where $I(\lambda)$ is the j^{th} periodogram point; $\lambda_j = 2\pi j/T$; T is the number of observations; β_0 is a constant; and υ_j is an error term, asymptotically i.i.d, across harmonic frequencies with zero mean and variance known to be equal to $\pi^2/6$. $M = g(T) = T^{\mu}$ with $0 < \mu < 1$ is the number of Fourier frequencies included in the spectral regression and is an increasing function of T. As argued by GPH the inclusion of improper periodogram ordinates M, causes bias in the regression which results in an imprecise value of d. To achieve the optimal choice of T, several choices need to be established in terms of the bandwidth parameter M = $T^{0.45}$; $T^{0.5}$; ..., $T^{0.7}$. The GPH fractional differencing test is performed on the stock return aiming at a prospective gain in estimation efficiency. The fractional distinction test tends to find out fractional constitution in a time series based on spectral investigation of its low-frequency dynamics.

4. Data Analysis and Findings

The series studied in this analysis include two stock indices, BSE SENSEX and NSE CNX NIFTY at daily frequencies in India. The period of study is from April 1999 to March 2008. The daily closing values of the individual indices were taken and daily index returns were calculated using the relation $r(t) = \ln(p_{t+1}) - \ln(p_t)$ where r(t) is the return on the index on t-th day, $\ln(p_{t+1})$, $\ln(p_t)$ represents natural logarithm of index value on t+1 day and t-th day respectively. We test for long memory on return, absolute return (mod value) and squared return series from SENSEX and NIFTY.

4.1 Descriptive Statistics

The statistical summaries of logarithmic return, absolute return and squared return series of both NIFTY and SENSEX are reported in Table1 below which shows that the sample means of all series are positive. The returns series of both the indices are negatively skewed and leptokurtic. This along with high value of Jarque and Bera (1987) statistic clearly suggests that return series of both the indices cannot be regarded as normally distributed. However, both absolute return series and squared return series are positively skewed and leptokurtic indicating non normal distribution.

Table 1: Descriptive Statistics

	NIFTY			SENSEX		
	Return	**Absolute return**	**Squared return**	**Return**	**Absolute return**	**Squared return**
Mean	0.00065	0.01159	0.00026	0.00066	0.011633	0.000262
Median	0.00154	0.00852	0.00007	0.00147	0.008661	0.000075
Maximum	0.07969	0.13053	0.01704	0.07931	0.118092	0.013946
Minimum	-0.13053	0	0	-0.11809	0.000013	0
Std. Dev.	0.01624	0.01139	0.00068	0.01618	0.011274	0.000628
Skewness	-0.57131	2.53266	10.2081	-0.49453	2.297102	8.152873
Kurtosis	7.81647	14.3644	187.717	6.8137	11.64986	123.3157
Jarque-Bera	2307.46	14577.6	3252277	1459.122	9017.121	1385724
Probability	0	0	0	0	0	0

4.2 Unit Root Tests

The results of unit root tests are displayed in the Table 2 given below.

Table 2: Unit Root Tests

	NIFTY			SENSEX		
	Return	**Absolute return**	**Squared return**	**Return**	**Absolute return**	**Squared return**
ADF	-34.2977*	-12.845*	-17.63*	-44.75*	-12.527*	-16.73*
PP	-44.481*	-36.427*	-28.99*	-44.75*	-37.536*	-31.27*
KPSS	0.204	0.3886	0.285	0.279	0.6998	0.497

a) The critical values are those of Mackinnon (1991).

b) * represent the rejection of null hypothesis at 1% level of significance.

The null hypothesis of presence of unit root in ADF test and PP test is rejected at 1% level of significance for logarithmic return, absolute return and squared return series of both NIFTY and SENSEX indicating all the data series are stationary. The same is further confirmed by KPSS test where the null hypothesis of stationary data series could not be rejected at 1% level of significance for logarithmic return, absolute return and squared return series of both NIFTY and SENSEX.

4.3 Visual Interpretation: Autocorrelation Function (ACF)

The Autocorrelation function was plotted against the time lag for logarithmic return, absolute return and squared return series of both NIFTY and SENSEX. The lag was taken upto 40 days. The autocorrelation is found to decay quickly and is insignificant in the logarithmic return series of both the indices (Fig. 1 and Fig. 2). However in case of absolute and squared return series, a slow decay in autocorrelation is observed (Fig. 3, Fig. 4, Fig. 5 and Fig. 6).

The ACF of the data series clearly indicates short memory in returns but long range dependence or persistence for absolute and squared return series in Indian stock market.

Figures of Autocorrelation Functions (ACF)

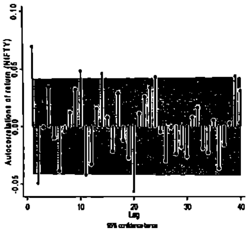

Fig. 1 - ACF of Return (NIFTY)

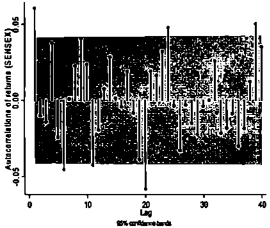

Fig. 2 - ACF of Return (SENSEX)

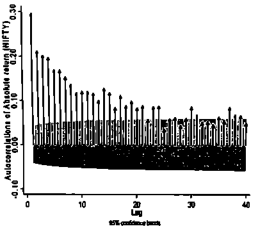

Fig. 3 - ACF of Absolute Return (NIFTY)

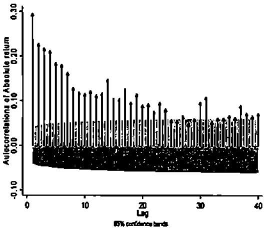

Fig. 4 - ACF of Absolute Return (SENSEX)

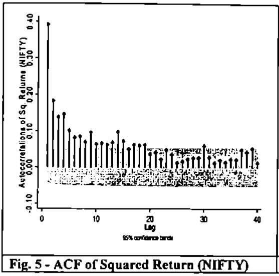

Fig. 5 - ACF of Squared Return (NIFTY)

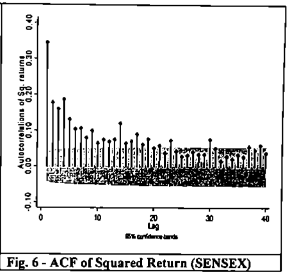

Fig. 6 - ACF of Squared Return (SENSEX)

4.4 Rescaled-Range (R/S) Analysis: Hurst-Mandelbrot's Classical R/S Statistic and Lo Statistic

The results of Rescaled-Range (R/S) Analysis are presented in the Table 3 obtained below where Hurst-Mandelbrot's Classical R/S Statistic and Lo Statistic are displayed.

Table 3: Hurst-Mandelbrot's Classical R/S Statistic and Lo Statistic

	NIFTY			SENSEX		
	Return	Absolute return	Squared return	Return	Absolute return	Squared return
Hurst-Mandelbrot's Classical R/S Statistic	1.51	4.58	3.52	1.61	5.19	4.13
Lo Statistic	1.47	2.63	2.05	1.56	2.93	2.44

Note: Critical values:

10% level of significance	[0.861, 1.747]
5% level of significance	[0.809, 1.862]
1% level of significance	[0.721, 2.098]

The estimated value of Hurst-Mandelbrot's Classical R/S Statistic suggests that the null hypothesis of no long-range dependence in case of return series of both NIFTY and SENSEX could not be rejected at 1% level of significance as estimated value of the statistic falls within the acceptance region. However, for both absolute and squared return, the null hypothesis is rejected at 1% level of significance. The critical values of the statistic are obtained from Lo (Table II, 1991). This clearly indicates that although logarithmic returns may not have long memory, returns without signs as well as volatility as measured by squared returns shows existence of longrun dependence in the series. Now since Classical R/S Statistic is sensitive to short range dependence and may give biased results in the case of short-range dependence, heterogeneities and nonstationary series, we also computed Lo's statistic which takes care of these shortcomings. The Lo statistic displayed in Table 4 also shows that the null hypothesis of no long-range dependence in case of return series of both NIFTY and SENSEX could not be rejected at 1% level of significance as estimated value of the statistic falls within the acceptance region. For squared return, Lo statistic rejects the null hypothesis at 1% level of significance for both NIFTY and SENSEX and in case of absolute return series, the null of no long range dependence is rejected for both NIFTY and SENSEX at 5% level and 1% level respectively. The results of both the tests are consistent and indicate short memory for return series and long memory for volatility.

4.5 The Spectral Regression Method (GPH statistic)

Table 4: GPH estimate of fractional differencing parameter (d)

M	Fractional Differencing Parameter (d)					
	NIFTY			SENSEX		
	Return	Absolute return	Squared return	Return	Absolute return	Squared return
$T^{0.45}$	0.0514 [0.1289] (0.3992)	0.4161* [0.1104] (3.7678)	0.2703* [0.0940] (2.8746)	0.0860 [0.1115] (0.7714)	0.48110* [0.1112] (4.3250)	0.35473 * [0.0986] (3.5979)
$T^{0.50}$	-0.0581 [0.0965] (-0.6021)	0.3911* [0.0849] (4.607)	0.2759* [0.07767] (3.5529)	0.00509 [0.1038] (0.0491)	0.43453 * [0.0971] (4.4751)	0.35572* [0.0852] (4.1749)
$T^{0.55}$	0.0318 [0.08875] (0.3590)	0.3331* [0.0704] (4.7350)	0.2626* [0.0674] (3.8918)	0.0510 [0.0816] (0.6244)	0.33299* [0.07179] (4.6383)	0.29901* [0.06845] (4.3680)
$T^{0.60}$	0.0416 [0.0685] (0.6073)	0.3987* [0.06283] (6.3462)	0.2869* [0.0554] (5.1792)	0.05231 [0.0652] (0.8022)	0.42224* [0.06488] (6.5084)	0.35173* [0.06382] (5.5113)
$T^{0.65}$	0.0272 [0.0509] (0.5338)	0.3809* [0.05426] (7.0202)	0.2643* [0.0485] (5.4499)	0.06126 [0.0549] (1.1157)	0.33885* [0.05143] (6.5883)	0.30920* [0.05726] (5.4003)
$T^{0.70}$	0.0069 [0.0459] (0.1506)	0.3621* [0.0459] (7.8883)	0.2544* [0.0418] (6.0844)	-0.0021 [0.0435] (-0.0483)	0.33710* [0.04125] (8.1718)	0.29486* [0.04503] (6.5485)

a) * represents the rejection of null hypothesis at 1% level of significance.
b) Standard errors in [ ] and t-statistics in ( ).

The above Table 4 reports estimates of the fractional differencing parameter (d) for the daily logarithmic return, absolute return and squared return series of both NIFTY and SENSEX. The test examine the null hypothesis of short memory (H_0: $d = 0$) against long memory alternatives (H_1: d > 0). As shown in table 5, the estimates of d are insignificant for a range of bandwidth ($M = T^{0.45}; T^{0.5}; \ldots, T^{0.7}$) for the logarithmic return series of both the indices. However, the estimates of the parameter d range from 0.4811 to 0.2544 and are statistically significant at 1% level to reject the null of short memory in the absolute and squared returns of two Indian stock markets. These results indicate that a long memory property exists in the volatility of two Indian stock markets. Moreover, findings support the Taylor effect, because in general, the estimate of the parameter is higher for the absolute returns than that of squared returns. The evidence on the presence of long memory in absolute and squared returns is similar to that obtained in previous research from major capital markets.

5. Conclusion

According to the market efficiency hypothesis in its weak form, asset prices incorporate all relevant information, rendering asset returns unpredictable. When return series exhibit long memory, they display significant autocorrelation between distant observations. Therefore, the series realizations are not independent over time and past returns can help predict futures returns, thus violating the market efficiency hypothesis. Exploring long memory property is appealing for derivative market participants, risk managers and asset allocation decisions makers, whose interest is to reasonably forecast stock market movements. The study examined the evidence of long memory in the Indian equity market. We computed Hurst-Mandelbrot's Classical R/S statistic, Lo's statistic, semi parametric GPH statistic to test the presence of long-memory in asset returns. All the tests are consistent with long range dependence in the absolute return and squared return series. Findings also support the Taylor effect as the estimate of the fractional differencing parameter is higher for the absolute returns than that of squared returns. However, we find no evidence of long-term memory in historical Indian stock market returns indicating Indian equity returns follow a random walk. Absence of long memory in return series of both the indices shows there was no evidence against the weak form of market efficiency in stock returns. Also the relevance of linear pricing models and statistical inferences about asset pricing models based on standard testing procedures is not questionable in absence of long range dependence in stock returns. Given the financial economic environment, settlement cycles, strong regulatory authority like SEBI and market micro structure in Indian market, a possible explanation for absence of long memory in return series may be based on the grounds that Indian markets may be informationally efficient, prices tend to reflect all publicly available information and any new information is fully arbitraged away. An alternative explanation was suggested by Lo (1991) when he suggested that ".... we find little evidence of long-term memory in historical U.S. stock market returns. If the source of serial correlation is lagged adjustment to new information, the absence of strong dependence in stock returns should not be surprising from an economic standpoint, given the frequency with which financial asset markets clear. Surely financial security prices must be immune to persistent informational asymmetries, especially over longer time spans". Presence of long memory in squared returns indicate volatility of asset returns which can be modeled using returns from the recent as well as remote past and hence derivative instruments can now be more efficiently priced.

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Capital Formation through Primary Market in India: A Study on Non-Government Public Limited Companies during Post Liberalization Era

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Abstract: The size and character of the primary market have undergone a rapid transformation and expansion since mid-eighties. Before liberalization, resource mobilization through primary market operation was low, but during early nineties with the repeal of Capital Issues Control Act, it increased gradually as many big projects have been launched after liberalization. After establishment of Securities and Exchange Board of India, major reforms in the primary market have taken place and investors' grievances have declined.

In this paper, an attempt has been made to examine the role of new issue market in capital formation in the post reform period in India with special reference to non-government public limited companies.

Key-words: New capital issue, public issue, rights issue.

1. Introduction

The capital market, representing the institutional sources of long-term funds, is the barometer of any country's economic development. The structure of the capital market consists of the primary market/new issue market and the secondary market. The primary market deals in only new securities which were not previously available and are offered to the investors for the first time. It does not have any organizational set-up located in any particular place. The primary market acts as a link-pin between savers and investors and creates the opportunity to put the savings of the investors' to the corporate houses and ultimately helps to promote economic growth.

The Indian economy has been going through economic reforms since 1991 to correct various distortions and disorientation, and generate incentives to foster capital market development. The Indian capital market has received special attention under the new economic policy. Reforms in the securities market, particularly with the establishment of SEBI, abolition of Controller of Capital Issues (CCI), market-determined allocation of resources and interest rate structure have greatly improved the regulatory framework and efficiency of the Indian capital market.

Several studies have been conducted on primary market in India by academicians, researchers and by the primary market advisory committees. Many scholarly books and articles have been brought out. Khan (1977) studied the role of new issues in financing the private corporate sector during the 1960's and early 1970's. He found that new issues were declining during this period. Patil (1986) opined that resource mobilization task was challenging one for the private corporate sector in the seventh plan period. Khambata and Khambata (1989) analyzed the growth and development of the Indian equity market and found that Indian capital market did not play a significant role in financing the industrial sectors during the period 1960 to 1980. Samuel (1996) showed that stock market play a limited role as a source of finance for Indian and U.S firms. Pagano, Panetta, and Zingales (1998) analyzed the market-to-book ratio of existing public firms in an industry and found that it has been the key deciding factor for Initial Public Offer (IPO) decision. Desai (2000) examined the reasons for sluggishness in the primary market. Lowry (2003) found that demand for capital and investors' sentiments are statistically and economically significant determinants of IPO volume. Arwah (2003) observed that primary capital market was unequivocal and IPOs were offered at a discount. Ghosh (2004) made a detailed investigation of the boom and slump phase of the Indian primary capital market during 1993 to 2001 and found that Indian companies might have depended more on long term market sentiments to decide on the timing of their IPOs. Shirai (2004) opined that during 1990-2001, equity market had not proved a stable source for financing.

Brau and Fawcett (2004) observed that condition of the secondary market is the most influential factor in timing an IPO. Ivanov and Lewis (2008), found that time variation in business conditions and investor sentiments prove to be economically significant determinants of IPO issue activity. The empirical evidence of Derrien and Kecskés (2008) has indicated that roughly 40 percent variation in equity issuance could be explained by economic fundamentals of Canadian petroleum industry. Blum (2011) analysed the US primary capital market and concluded that capital demand, investor sentiment and market condition are the major determinants of IPO.

From the above literature review it has been found that resource mobilizations from primary market depend on the factors like condition of the secondary market, rate of interest at which corporate sector can borrow the required funds, condition of the overall economy, investors sentiment etc. In this paper, an attempt has been made to investigate the capital formation through primary market for the non-government public limited (NGP) companies.

2. Objectives of the Study

In the light of above discussion, the current study is aimed at analysing and examining the pattern of resource mobilization in the primary market by the non-government public limited companies in India. The role of primary capital market in India in capital formation in general, and in respect of financing private corporate sectors have been analyzed. More specifically, the study addresses the following objectives.

i) Ascertain the aggregate pattern of resource mobilization by the non-government public limited companies.

ii) Discuss the type and instruments-wise pattern of issues.

iii) Examine the primary market activity in capital formation.

iv) Analyse the contribution of equity market in total resource mobilization.

3. Database

The study depends exclusively on secondary data. Secondary data are collected from SEBI Bulletin and Annual Reports, Hand Book of Statistics on Indian Economy of Reserve Bank of India (RBI), RBI Annual Reports and various reports published in financial journals, financial magazines and National Stock Exchange of India (NSE) and Bombay Stock Exchange of India (BSE) websites.

In this study, annual data from 1990-91 to 2010-11 have been used in case of all the variables like Gross Domestic Capital Formation (GDCF), Net Domestic Capital Formation (NDCF), Prime Lending Rate (PLR), BSE-SENSEX (Sensitive Index) and Net Resource Mobilized by Non-Government Public Limited Companies (NGP). Annual data have been used because of non-availability of monthly data for GDCF, NDCF, and PLR.

i) **Gross Domestic Capital Formation (GDCF):** GDCF is the total investment that takes place in an economy within any specific time period. In other words, it refers to the net additions to capital stock in an accounting period, after depreciation.

ii) **Net Domestic Capital Formation (NDCF):** If we deduct the consumption of fixed capital from GDCF then we get Net Domestic Capital Formation (NDCF). The NDCF is a measure of the net domestic investment during the year.

iii) **Prime Lending Rate (PLR):** Rate of interest is one of the deciding factors for resource mobilization. Low rate of interest made industries more dependent upon financial institutions. From August 1991, the government of India allowed all term-lending institutions to charge interest rates according to the risk perception of the concerned project. Minimum Prime Lending Rate (PLR) of RBI has been used as the proxy for available lending rate.

iv) **BSE-SENSEX:** SENSEX i.e. "Sensitive Index" is an indicator of performance of thirty companies at Bombay Stock Exchange (BSE) which are chosen from various sectors of the economy by a committee on the basis of a certain given criteria. It is taken to be an indicator of financial health of the capital market of India.

4. Methodology

With a view to accomplish the stipulated set of objectives of our study, different methods have been adopted. First of all, to analyze the primary market activity, correlation co-efficient is calculated to study the relationship between the new capital issues (NCI) in primary market and the chosen variables. Finally the regression equation is estimated through Ordinary Least Square (OLS) method with the help of E-views statistical package.

In order to avoid a spurious regression situation the variables in a regression model must be stationary or co-integrated. A stationary analysis is also called unit root test. Various parametric and non-parametric tests have been developed for finding out whether a series is stationary or not. The fact whether time series used in this study has unit root or not, has been investigated by using Augmented Dickey-Fuller (ADF) test method. The test is based on the Null Hypothesis (H_0): Y_t is not I (0), if the calculated ADF statistic is less than its critical value from Fuller's table, then the null hypothesis (H_0) is accepted and the series is non-stationary.

Therefore, in the first step of regression, we use ADF tests on the time series variables to investigate whether they are stationary or not. In the second step, we estimate regression. The regression equations estimated by the OLS method is given as:

$NCI = \alpha_1 + \beta_1 NDCF + \gamma_1 PLR + u1$ --------------- (1)

$NCI = \alpha_2 + \beta_2 GDCF + \gamma_2 PLR + u2$ --------------- (2)

$NCI = \alpha_3 + \beta_3 SENSEX + \gamma_3 PLR + u3$ --------------- (3)

$NCI = \alpha_4 + \beta_4 GDCF + \delta_4 NDCF + \rho_4 SENSEX + \gamma_4 PLR + u4$ --------------- (4)

Hypotheses:

Two sets of hypothesis have been formulated to assess the activity of primary securities market regarding fueling corporate sector growth.

First Hypothesis:

Null Hypothesis (H_0): Primary market failed to play its role.

Alternative Hypothesis (H_1): Primary market played significant role for capital formation.

Second hypothesis:

Null Hypothesis (H_0): Primary market activity is not influenced by the secondary market activity.

Alternative Hypothesis (H_1): Primary market activity is highly influenced by the secondary market activity.

5. Primary Securities Market in the Pre-liberalization Period

India has been following planned economic development since early 1950's and Controller of Capital Issues (CCI) became the potent instrument for regulating the investment in accordance with the objectives of planning. But despite the commencement of economic planning in 1951-52, the new issue market could not make any remarkable growth until 1955. During the pre-liberalization period, the Indian capital market was not well organized. Primary capital market was highly regulated under the provisions of the Capital Issues (Control) Act, 1947. This Act was passed in April 1947 with a view to facilitating the post war industrial expansion and providing protection to the investors.

In the post-independence period, new issue markets suffered from structural gaps. There was particularly no specialist institutional arrangement for the origination of issues of capital. Another serious drawback of the system was the absence of an inbuilt provision for distributing the securities to the investing public. The companies had to obtain prior approval from the CCI for the issue of new securities for raising capital. In the pre-liberalization period, the shares were issued at par in most of the cases. The issue of shares at a premium was rare.

The size of the premium depended on the formula prescribed by the CCI. As a result, the magnitude of the capital raised remained lower and the primary market lacked the desired flexibility. Table 1 shows the new issue activity in India during 1951-1991 period.

Table 1 : New Capital Issues by Non-government Public Ltd. Companies during the period from 1951-1991

(Rs. in crore)

Period	Equity	Debentures	Preference	Total	Annual Average
1951-1960	202	44	39	285	28.5
1961-1970	462	188	77	728	72.8
1971-1980	746	190	56	992	99.2
1981-82 to 1990-91	7857	15459	40	23356	2335.6

(Source: RBI Annual Reports, Various Years)

The annual average of amount of capital raised by non-government public limited companies increased from Rs. 28 crore during 1951 to 1960, to Rs 2335.7 crore during 1981-91. The capital formation by the non-government public limited companies during the forty years of pre-reform period was very low as compared to post reform period. In the post independent period, no capital was mobilized by the Public Sectors Undertakings (PSU). During 1989-90 to 1991-92, PSUs raised fund only through issue of bonds. They started raising capital through equity after liberalization.

6. Capital Formation through Primary Securities Market in the Post-liberalization Period

The Indian capital market began to expand in the late 1980's. Resource mobilization in primary market got a boost after establishment of SEBI in 1992. After the repeal of CCI Act, availability of free pricing of equities and buoyant conditions of the secondary market have been the main reasons behind the massive growth of primary market activity during 1991-92 to 2010-11 which is shown in Table 2 below.

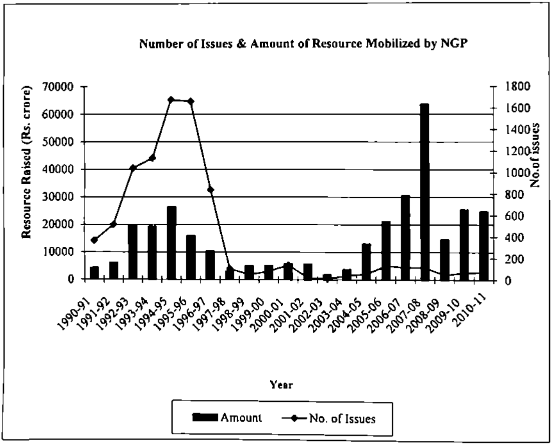
Table 2: Number of Issues and Amount of Resource Mobilized by NGP Companies during 1991-92 to 2010-11

Year	No. of Issues	Amount (Rs. in Crore)	% Change Over Last Year	
			No. of Issues	Amount
1990-91	364	4312.2	NA	NA
1991-92	514	6193.1	41.208	43.618
1992-93	1040	19803.4	102.334	219.76
1993-94	1133	19330.3	8.942	-2.388
1994-95	1678	26416.7	48.102	36.659
1995-96	1663	15997.6	-0.893	-39.441
1996-97	838	10409.5	-49.609	-34.93
1997-98	102	3138.3	-87.828	-69.851
1998-99	48	5013.1	-52.941	59.739
1999-00	79	5153.3	64.583	2.796
2000-01	139	5818.1	75.949	12.9
2001-02	19	5692.4	-86.33	-2.16
2002-03	9	1877.7	-52.631	-67.013
2003-04	38	3721.8	322.222	98.21
2004-05	54	13079.2	42.105	251.421
2005-06	131	21154.0	142.592	61.737
2006-07	117	30603.0	-10.687	44.667
2007-08	115	63637.9	-1.709	107.946
2008-09	45	14670.6	-60.869	-76.946
2009-10	68	25478.7	51.111	73.671
2010-11	70	24830.1	2.9411	-2.5456

Source: RBI Handbook of Statistics 2010-11

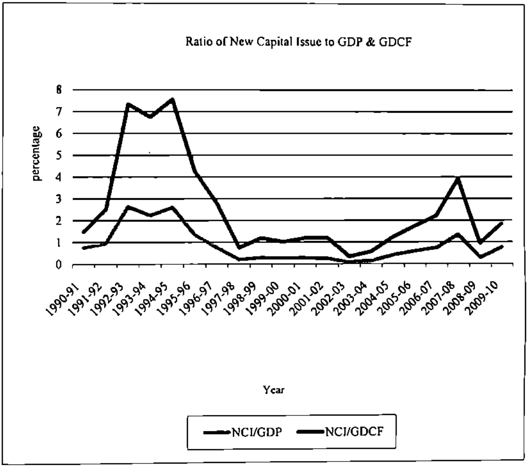
From the above table it can be observed that resource mobilization through primary market has shown a significant increase in the years following liberalization with both the number of issues as well as the amount mobilized. The amount of resource mobilized from primary capital market was the highest ever during 1994-95 but declined in subsequent years (fig.1). During the period from 1995-96 to 1997-98, large number of companies who raised funds from the capital market subsequently disappeared. As a result, huge number of investors lost their investments and confidence in primary market, and preferred bank deposits and safe retirement instrument insurance schemes. As a result, the number of IPO, rights issue etc. declined during the period 1997-98 to 2003-04.

Figure 1: Total Resource Mobilization by NGP Companies



The share of capital issues to GDP as measures of resource mobilization by the capital market shows an increasing trend (fig. 2) up to 1994-95, but is unable to sustain this trend. Also, the new capital issue to GDCF declined after 1994-95. Again, the resource mobilization as a percent of GDP and GDCF in 2005-06 was lower than that in 1990-91. Fig. 2 shows the ratio of new capital issues to GDP and GDCF.

Figure 2: Ratio of New Capital Issue to GDP and GDCF



7. Analysis of Instrument-wise Contribution in Primary Market

Before 1992, Indian companies were required to obtain approval from the office of CCI for raising capital. New companies were allowed to issue shares only at par values. Only existing companies with substantial reserve were allowed to issue shares at a premium. The Capital Issues (Control) Act was repealed in May 1992. After that, companies were allowed to price their issues without any intervention from the authorities. New capital issues through equity related instrument in the post 1992 phase increased sharply after the abolition of CCI as shown in Table 3:

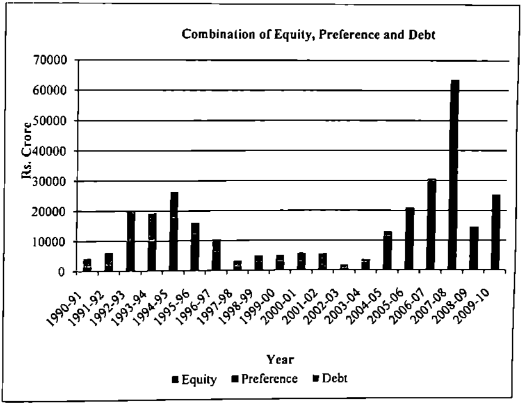
Table 3: Contribution of Equity Market

Year	Equity/ Total Issue (Percentage to Total issues)	Preference/ Total Issue	Debt/ Total Issue
1990-91	29.78	0.3	69.91
1991-92	30.94	0.02	69.03
1992-93	50.26	0.00	49.74
1993-94	51.52	0.49	48.47
1994-95	65.92	0.94	33.58
1995-96	74.24	0.72	24.82
1996-97	58.61	0.14	40.66
1997-98	37.04	1.19	62.82
1998-99	51.12	0	47.69
1999-00	53.41	2.44	46.59
2000-01	44.89	0	52.74
2001-02	15.12	0	84.88
2002-03	24.50	0	75.49
2003-04	66.39	0	33.61
2004-05	87.56	0	12.44
2005-06	98.79	0.05	1.16
2006-07	97.23	0	2.77
2007-08	89.33	8.61	2.06
2008-09	100.00	0	0
2009-10	99.29	0	0.71
2010-11	100.00	0	0

Source: compiled by authors

From the above table it has appeared that issue of equity instruments increased up-to 1995-96, but this increasing trend declined to just only 15.12 % of total resource mobilization in the year 2001-02. From 2003-04, primary market activity increased substantially. Issuance of equity share increased against the other primary market instruments. During the year 2008-09 total capital mobilized through issue of equity shares declined due to global financial crisis. The combination of amount of capital raised by issuing equity, debt and preference shares are shown in Fig. 3.

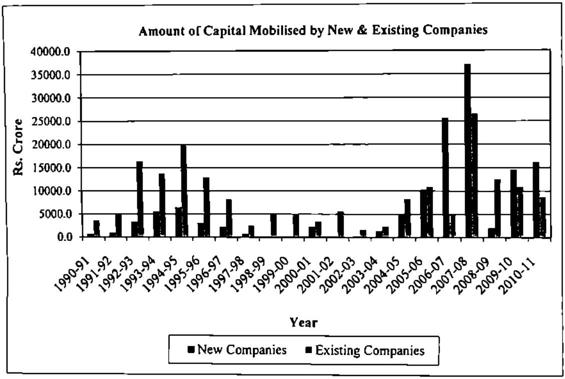
Figure 3: Combination of Amount of Capital Raised by Issuing Equity Shares, Preference Shares and Debt



It has been found from the above chart and table that in the early stage of reforms, capital raised through debt instrument was high. But after 2003-04, the importance of debt instrument has declined and this trend continues. The Indian primary market shows a sluggish trend from 1996-97 to 2002-03; during this period percentage of debt issue was more than other instruments. Revival of primary market started from 2004-05. Resource mobilized from the issue of preference share was not effective, except for the year 2007-08. From 2004-05 onwards, maximum funds are mobilized through the issue of equity instrument and it has played a dominant role compared to other instruments.

The existing companies play a dominating role compared to new companies in mobilising funds from the market. Funds raised by the new and existing companies are shown in fig. 4.

Figure 4: Resource Mobilised by New and Existing Companies



Up to 2009-10, existing companies raised Rs. 179711.00 crore with an average of Rs. 31.03 crore per issue. During the last 20 years, total fund mobilized by new companies were Rs. 121789.80 crore, with an average of Rs. 50.68 crore per issue.

8. Empirical Analysis

In this section we have analysed the relationship between the primary market activity and gross domestic capital formation, net domestic capital formation, and gross capital formation by private corporate sectors based on time-series data for the periods 1990-91 to 2010-11. The variables in the equation are selected because of their economic meaningfulness and direct relationship.

Table-4 shows correlation among the variables under study.

Table 4: Correlation Matrix

Variables	NCI	GDCF	NDCF	PLR	SENSEX
NCI	1	0.654507	0.729811	0.079955	0.863879
GDCF	0.654507	1	0.984737	0.344745	0.861267
NDCF	0.729811	0.984737	1	0.319735	0.886793
PLR	0.079955	0.344745	0.319735	1	0.288324
SENSEX	0.863879	0.861267	0.886793	0.288324	1

From the above table it has been found that almost all the variables are moderately correlated with NCI apart from PLR. Correlation between GDCF and NDCF are very high as GDCF itself constitutes a major part of NDCF.

Test for Stationary

The unit root test is done assuming the data set to have a trend. From Table 5 it can be concluded that NCI, GDCF, NDCF, SENSEX, and PLR are stationary at first difference, if the data set has a trend, as per Augmented Dickey-Fuller (ADF) test. The lag length is chosen based on Schwarz Information Criterion (SIC) as suggested by Enders (2008).

Table 5: Results of Dickey Fuller Unit Root Test for the Variables at First Difference

Variables	Constant	Constant, Linear Trend
NCI	-5.999346 (0) [0.0001]	-5.804382* (0) [0.0010]
GDCF	-1.753278 (1) [0.3889]	-4.871548* (0) [0.0057]
NDCF	-4.38016 (0) [.0035]	-5.455414* (0) [0.0020]
SENSEX	-4.42077 (0) [0.0032]	-4.622136* (0) [0.0091]
PLR	-5.133503 (0) [0.0008]	-5.516598* (0) [0.0017]

Note: Asterisk (*) denotes rejection of unit root hypothesis at 5% level of significance; ( ) Lag lengths for ADF; [ ] Mackinnon (1991) one-sided p-values.

Regression Analysis

We have examined the relationship between primary market issues and gross capital formation through regression technique. The model used here has the following functional equations.

$NCI = \alpha_1 + \beta_1 NDCF + \gamma_1 PLR + u_1$ -------- (1)

$NCI = \alpha_2 + \beta_2 GDCF + \gamma_2 PLR + u_2$ -------- (2)

$NCI = \alpha_3 + \beta_3 SENSEX + \gamma_3 PLR + u_3$ -------- (3)

$NCI = \alpha_4 + \beta_4 GDCF + \delta_4 NDCF + \rho_4 SENSEX + \gamma_4 PLR + u_4$ -------- (4)

Where,

NCI= New Capital Issue

NDCF= Net Domestic Capital Formation

GDCF= Gross Domestic Capital Formation

SENSEX= BSE Sensitive Index

PLR= RBI Prime Lending Rate

$\alpha_1, \alpha_2, \alpha_3$ & α_4 = Constant terms; u_1, u_2, u_3 & u_4= Random Error Terms

Findings

The regression results that we have are as follows for equation (Details of the results are given in Annexure: I, II, III, and IV)

Equation (1)

NCI= -4850.416 + 0.149566 NDCF + 236.9646 PLR

t-stat: (-1.514590) (3.784413) (0.118236)

p-value: (0.1494) (0.0016) (0.9074)

Adjusted R-square = 0.409526

Equation (2)

NCI= -5926.427 + 0.123088 GDCF + 212.6577 PLR

t-stat: (-1.559001) (3.100162) (0.097417)

p-value: (0.1386) (0.0069) (0.9236)

Adjusted R-square = 0.300916

Equation (3)

NCI= -4738.48 + 7.151924 SENSEX – 1608.788 PLR

t-stat: (-2.343132) (7.217945) (-1.170136)

p-value: (0.0324) (0.0000) (0.2591)

Adjusted R-square = 0.737084

Equation (4)

NCI= 965.0278 -0.349930 GDCF+0.352667 NDCF+7.555069 SENSEX-1400.321 PLR

t-stat: (0.374657) (-2.763472) (2.364156) (4.685577) (-1.162137)

p-value: (0.7135) (0.0152) (0.0331) (0.0004) (0.2646)

Adjusted R-square = 0.814598

Hence the parameters of the explanatory variables are significant and signs as desired. The values of R^2 (0.475134) and adjusted R^2 (0.409526) are high and it is significantly different from zero in (1). There is a rule of thumb, according to Granger and Newbold [Gujrati (2007)-page-826] to check whether any estimated regression is spurious or not. If $R^2 > d$, the estimated equation said to be spurious-where *d* refers to Durbin-Watson value. In the above estimated equation, Durbin-Watson Statistic (d=1.861540) is sufficiently greater than the value of R^2 (0.475), which strongly proves that the relationship between new capital issue by NGP (NCI) and other explanatory variables is not spurious. Another noteworthy feature, revealed from the Durbin-Watson (DW) statistic is that there is no specification error in the model at 1% level (as the significance points of d_L and d_U at 0.01 level of significance are 0.952 and 1.147 respectively, where the null hypothesis is mis-specification of the model). As the Durbin-Watson (DW) statistic is more than 2 in the case of (2) and (4) and near to 2 in (1) and (3), one can conclude that autocorrelation does not arise in these results.

With regard to the explanatory variables, the coefficient of SENSEX is significant at 1% level and coefficients of GDCF and NDCF are significant at 5% level. As GDCF and NDCF are highly correlated with each other (coefficient of correlation is 0.984), the sign of the coefficient of GDCF is not desired in (4). The coefficient of PLR is insignificant in all the equations where it is included. Therefore we may conclude that primary securities market activity is not influenced by the RBI prime lending rate. Again, we analyze the primary securities market activity with gross domestic capital formation in (2). The results show that there is a moderate relationship with capital formation, where GDCF is significant at 1% level. Though the values of R^2 (0.3785) and adjusted R^2 (0.3009) are not so high but are significant.

9. Conclusion

In the post- liberalization period, after the abolition of CCI, resource mobilization from the primary market has increased, but after mid-nineties number of issues declined sharply. However, during 1992 to 1996 more than Rs. 81548 crore were raised through public issues and right issues by four thousand odd companies. Many new companies who had tapped this market were no longer traceable and investors lost their money. As a result primary market remained dull up to 2004-05. Scams of Harshad Mehta, vanishing companies, IPO Demat were not only affecting the stock market, but the investors' sentiment as well, and as a result investors willingness to invest in the capital market instruments declined and they looked to other avenues of investment.

The regression result shows that there is statistically significant relationship between primary market activities in the post liberalization era and the net and gross domestic capital formation of the country and also the activity of secondary capital market. We may conclude that the capital market and capital formation are closely related. We also accept our alternative hypothesis that the primary capital market activity is influenced by the condition of the secondary market as it played a significant role in capital formation of the country. But the share of non-government public limited company in the gross capital formation has decreased in the post liberalization period as compared to pre liberalization period, though the resource mobilization activity has increased after the establishment of SEBI.

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Annexure I

Summary output of regression:

$NCI = \alpha_1 + \beta_1 NDCF + \gamma_1 PLR + u_1$ ---------------- (1)

Dependent Variable: NCI				
Method: Least Squares				
Sample Period: 1990-91 to 2010-11				
Included Observations: 18 after adjustment				
Variable	Coefficient	Std. error	t-statistic	P-value
Intercept	-4850.416	3202.462	-1.514590	0.1494
NDCF	0.149566	0.039522	3.784413	0.0016
PLR	236.9646	2004.170	0.118236	0.9074
R-square	0.475134	Mean dependent var		1114.026
Adjusted R-square	0.409526	S.D. dependent var		15416.80
S.E of regression	11846.63	Akaike info criterion		21.74141
Sum square resid	2.25E+09	Schwarz info criterion		21.89054
Log likelihood	-203.5434	F-Statistic		7.241983
Durbin-Watson Stat	1.861540	Prob (F-Statistic)		0.005760

Annexure II

Summary output of regression:

$NCI = \alpha_2 + \beta_2 GDCF + \gamma_2 PLR + u_2$ --------------- (2)

Dependent Variable: NCI				
Method: Least Squares				
Sample Period: 1990-91 to 2010-11				
Included Observations: 19 after adjustment				
Variable	Coefficient	Std. error	t-statistic	P-value
Intercept	-5926.427	3801.425	-1.559001	0.1386
GDCF	0.123088	0.039704	3.100162	0.0069
PLR	212.6577	2182.966	0.097417	0.9236
R-square	0.378592	Mean dependent var		1114.026
Adjusted R-square	0.300916	S.D. dependent var		15416.80
S.E of regression	12890.18	Akaike info criterion		21.91026
Sum square residual	2.66E+09	Schwarz info criterion		22.05938
Log likelihood	-205.1475	F-Statistic		4.873993
Durbin-Watson Stat	2.024951	Prob (F-Statistic)		0.022234

Annexure III

Summary output of regression:

$NCI = \alpha_3 + \beta_3 SENSEX + \gamma_3 PLR + u_3$ -------------- (3)

Dependent Variable: NCI				
Method: Least Squares				
Sample Period: 1990-91 to 2009-10				
Included Observations: 18 after adjustment				
Variable	Coefficient	Std. error	t-statistic	P-value
Intercept	-4738.480	2022.285	-2.343132	0.0324
SENSEX	7.151924	0.990853	7.217945	0.0000
PLR	-1608.788	1374.873	-1.170136	0.2591
R-square	0.766297	Mean dependent var		1114.026
Adjusted R-square	0.737084	S.D. dependent var		15416.80
S.E of regression	7905.016	Akaike info criterion		20.93232
Sum square resid	1.00E+09	Schwarz info criterion		21.08144
Log likelihood	-195.8571	F-Statistic		26.23148
Durbin-Watson Stat	1.944534	Prob (F-Statistic)		0.000009

Annexure IV

Summary output of regression:

$NCI = \alpha_4 + \beta_4 GDCF + \delta_4 NDCF + \rho_4 SENSEX + \gamma_4 PLR + u_4$ -------------- (4)

Dependent Variable: NCI				
Method: Least Squares				
Sample Period: 1990-91 to 2009-10				
Included Observations: 19 after adjustment				
Variable	Coefficient	Std. error	t-statistic	P-value
Intercept	965.0278	2575.763	0.374657	0.7135
GDCF	-0.349930	0.126627	-2.763472	0.0152
NDCF	0.352667	0.149172	2.364156	0.0331
SENSEX	7.555069	1.612409	4.685577	0.0004
PLR	-1400.321	1204.954	-1.162137	0.2646
R-square	0.855799	Mean dependent var		1114.026
Adjusted R-square	0.814598	S.D. dependent var		15416.80
S.E of regression	6638.218	Akaike info criterion		20.66001
Sum square resid	6.17E+08	Schwarz info criterion		20.90855
Log likelihood	-191.2701	F-Statistic		20.77159
Durbin-Watson Stat	2.233932	Prob (F-Statistic)		0.000009

Analysis of Performance of Select Merchant Banks in India – A Study

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Abstract: A merchant bank is a financial institution which facilitates providing capital to companies in the form of share ownership, instead of loans. They mainly engage in the business of issue management through selling, buying and underwriting of securities. They also provide corporate advisory services to the firm. Therefore they play the role of underwriter, advisor, manager and consultant. According to the US Federal Deposit Insurance Corporation, the term merchant banking is generally understood to mean negotiated private equity investment by financial institutions in the unregistered securities of either privately or publicly held companies. In this context, the paper highlights a comparison between Indian commercial and development banks engaged in merchant banking activities over five years and relative performance of the same in respect of various financial ratios.

Key-words: Merchant banking, financial services, issue management, private equity investment, liberalization.

1. Introduction

Financial services are an important component of financial system. The smooth functioning of financial system depends upon the range of financial services extended by the providers. Financial services have witnessed remarkable changes in the recent past after the implementation of "liberalization, privatization and globalization." Earlier the services provided by the commercial banks were mainly confined to accepting deposits and lending money in the mode of cash. Though financing was its main business and demand deposits were the only key feature, it suffered from various demerits such as:-

i) *Absence of proper records*: Ascertainment of the total indebtedness of some classes of borrowers, especially the farmers became difficult because of absence of proper records of land rights which, in turn, created the problems of over financing or of recovery.

ii) *Difficulty in verifying actual utilization of loans*: There was often misuse of funds in case of medium term loans, which created difficulty in verifying the actual utilization of funds.

iii) *Difficulty in judging the credit worthiness*: Due to lack of sufficient knowledge of the character of the borrower, it was difficult to judge their credit worthiness.

iv) *Lack of sufficient supervision*: Due to lack of sufficient supervisory staff in the bank, loans were misused.

Therefore effective monitoring became indispensible to fill up the above loopholes and hence the concept of merchant banking emerged.

Another important reason for the growth of merchant banking has been the developmental activities carried out throughout the country, exerting excess demand on the sources of funds for ever expanding industry and trade thus leaving a widening gap between the supply and demand of investible funds. In the circumstances, corporate sector had the only alternative to avail of the capital market services for meeting their long term financial requirements through capital issues of equity and debentures. With the growing demand for funds, there was pressure on the capital market that forced the commercial banks, share brokers and financial consultant firms to enter into the field of merchant banking. The result being that all the commercial banks and foreign banks now have their merchant banking windows. There has been a mushroom growth of financial consultancy firms and brokerage firms doing advisory functions and managing public issues in syndication with other merchant bankers. Therefore merchant banks have evolved as a financial institution primarily engaged in offering financial services and advice to corporations and wealthy individuals on how to use money. The term can also be used to describe the private equity activities of banking.

In older times, merchant banks were also known as "accepting and issuing houses" in the UK and "investment banks" in the USA. Usually they handled coastal trade and master's goods on a commission basis and financed risky venture projects, for which they charged heavy interest. They often incurred heavy losses. They accepted bills for payment. These were in addition to the merchant banking functions of commercial banking. In fact there was no distinction between the functions of merchant banking and commercial banking until 1932. Later the Glass Steagall Act, 1933, US, distinguished the functions of merchant banking from commercial banking. However, in 2000, the Clinton Administration allowed investment banks to discharge the functions of commercial banks in addition to their usual functions of investment banking. This was effected through an amendment in the Glass Steagall Act.

Although merchant banking activities were ushered in two decades ago, it was only in 1992 after the formation of Securities and Exchange Board of India that it has become operational. Today a merchant banker, who has the ability to merchandise, can create and expand a need and fulfill capital requirements.

In India, prior to the enactment of the Indian Companies Act, 1956 managing agents acted as issue houses for securities, evaluated project reports, planned capital structure and, to some extent, provided venture capital for new firms. Few share broking firms also functioned as merchant bankers. The need for specialized merchant banking services was felt in India with the rapid growth in the number and size of the issues made in the primary market.

As planning and industrial policy initiated since 1960s envisaged the setting up of new industries and technology, greater financial sophistication and financial services have become necessary requirements. Economic development requires specialist financial skills, finance companies for consumer lending and mortgage finance, agricultural banks for rural development and a range of government and government sponsored institutions. As new units were set up and business expanded, they required additional financial services which were then not provided by the banking system. To keep pace with this globalization and liberalization process in the banking system, the Government of India was very keen to bring the capital market in line with international practices through gradual de-regulation of the economy. It led to liberalization of the capital market in the country with more expectations from the primary market to meet the growing needs for funds for investment in trade and industry. Thus there was a vital need to strengthen the capital market which could only be achieved through structural modifications by introducing new mechanisms and new instruments, and by taking steps for safeguarding the interest of the investors through proper disclosures and transparency. Therefore, merchant banks came into existence. It serves a dual role within the financial sector-

- through deposits or sale of securities, they obtain funds for lending to their clients, and
- the other role is to act as agents in return for fee.

SEBI envisages a mandatory role for merchant banks in exercising due diligence apart from issue management, in buy-backs and public offer in takeover bids. Their underwriting and corporate financial services are all fee based.

The Banking Commission in its Report in 1972 has indicated the necessity of merchant banking service in view of the wide industrial base of the Indian economy. The Commission was in favor of separate institutions (as distinct from commercial banks and term lending institutions) to render merchant banking services. The Commission suggested that they should offer investment management and advisory services particularly to the medium and small savers. The Commission also suggested that they should be able to manage provident funds, pension funds and trusts of various types. Merchant banking services were formally initiated in the Indian capital markets when the then Grindlays bank received the license from Reserve Bank in 1967.

Following Grindlays bank, Citibank set up its merchant banking division in 1970. Consequent to the recommendations of Banking Commission in 1972 that Indian banks should start merchant banking services as part of their multiple services that they could offer to their clients, State Bank of India (SBI) started the merchant banking division in 1972. In the initial years, the SBI's objective was to render corporate advice and assistance to small and medium entrepreneurs. The commercial banks that followed State Bank of India in setting up merchant banking units were Central Bank of India, Bank of India and Syndicate bank in 1977; Bank of Baroda, Standard Chartered bank and Mercantile bank in 1978; United Bank of India, United Commercial Bank, Punjab National Bank, Canara Bank and Indian Overseas Bank in late seventies and early eighties. Among the development banks, ICICI started merchant banking activities in (1973), followed by IFCI (1986) and IDBI (1991). As of now there are 135 Merchant bankers who are registered with SEBI in India.

Not many but still some problems are faced by merchant banks, especially those operating in India. They are as follows:-

(a) *Industry compartmentalization*: A company which is in merchant banking business is expected to have expertise in underwriting, hire-purchase, leasing, portfolio management and money lending. But RBI does not permit merchant banking firms to get into these activities. So the same promoters have to set up different companies for different purposes. Management cost increases as a result of expertise pooling i.e., multiple use of same talent is not possible.

(b) *Regulations*: Though regulations are much better now, there is still scope for further improvement. Merchant bankers can be made more accountable and responsible. Professional qualification focused on merchant banking is not available. Industry is not well recognized and all the players do not play the same tune. This is specifically evident in comparison with insurance industry and mutual funds industry.

(c) *Malafide* practices: Corporate culture in India is better now, but still many corporate are unscrupulous and biased. Favored allotment of shares, tampering with project appraisal report to the bankers is common. Corporates like to use merchant banks for such malafide intentions.

In view of the above problems, merchant bankers face a challenging task in fine tuning their activities to the requirements of the growth pattern of the corporate sector, the industry and the economy as a whole. To meet these challenges merchant bankers need to be more vigorous and strategic in discharging their functions. They also have to adopt new ways and means in discharging their role. This necessitates an evaluation of the performance of merchant bankers operating at present with a view to determining their superlative financial performance and the extent to which merchant bankers are discharging their functions effectively and efficiently.

The study is divided into six sections. Literature review is discussed in Section-II. Section-III deals with the objective of paper. Research methodology is highlighted in Section-IV. Section-V discusses the analysis and findings. Section-VI concludes the study.

2. Literature Review

The merchant banking services dates back to the 17th and 18th century in the UK and USA. But it was not until the 1970s that the merchant banking practices started in India. Extensive research work has been carried out to analyse the various pros and cons of merchant banking practices followed in different countries. *Stanley Chapman* (1984) stated in his book about the evolution of the role of the merchant bankers, specially the market leaders like Rothschilds, Barrings, Warburgs, Schroders. *Ramesha* (2008) in his article "Merchant Banking" enumerated the history of merchant banking in the late 17th and 18th century in Europe. Merchant Banking started in Europe by merchant adventurers who were supported by wealthy groups of people. At that time, there was a network of overseas trading from where these merchant adventurers collected huge amounts of money to finance trade across different parts of the world. Other European colonies like Dutch merchant adventurers, French and Portuguese also started their merchant banking activities in the same manner. The article also consisted of modem merchant banking which has been considerably broadened to include a composite number of modem day skills such as role of an entrepreneur, financial advisor, investment banker, portfolio manager, underwriter etc. With these modified functions of merchant banking, the concept of merchant bank has evolved as any person engaged in the field of issue management either by making arrangements regarding buying, selling, subscribing to securities as manager, consultant, advisor or rendering any corporate advisory services in relation to such issue management is regarded as a merchant banker. Further, the author gives a step by step break-up of financial institutions performing merchant banking functions in India, together with objectives and activities of merchant bankers.

E.Gordon and K. Natarajan (2009) examined the concept, objectives, functions, types, origin and procedural requirements of merchant banking in India. *Valentine V. Craig* (2001), in his article, described the evolution of private equity market in the United States as the term merchant banking is generally understood as private equity investment made in the unregistered securities of public or privately held companies. *H.R. Machiraju* (2004) examined a comprehensive and updated version of the functions of merchant bankers apart from mandated functions. *Madhu Vij and Swati Dhawan* (2011) stated the basic concepts, functions, regulatory issues of merchant bankers. They have not only dealt with merchant banking and financial services sector in India but also with its various issues and dimensions in a well structured format.

Thus, merchant banking is not a recent origin. In India, many commercial, developmental, private financial institutions engage themselves in merchant banking activities as a separate activity of these institutions. SEBI has also laid down various rules, regulations, and procedures of merchant banking activities taken up by financial institutions. A systematic research on the performance of select merchant banking firms has not appeared in published form in India as yet. Accordingly, the proposed study aims at fulfilling this vacuum.

3. Objective of the Study

The objective of this study is to measure the relative performance of both commercial and development banks engaged in merchant banking activities in India.

4. Research Methodology

a) Sample selection: A sample of five merchant banks INDBANK Merchant Banking Services Ltd., CANBANK Financial Services Ltd., IDBI Capital Market Services Ltd., ICICI Securities Ltd., and SBI Capital Markets Ltd. has been selected for performance evaluation based on their continuous availability of data.

b) Nature of variables: Performance of selected merchant banks is evaluated based on three standard ratio categories i.e. Turnover ratio, Return ratio and Liquidity ratio to judge the profitability, solvency and liquidity positions. Two components of each ratio have been selected.

c) Consideration of time period: A recent time period comprising five financial years, from 2005 to 2009, has been selected as the period of study to evaluate financial performance of select merchant bankers in India.

d) Collection of data: The relevant data for the study have been the audited financial statements of five financial years of five banks and such data have been collected from the secondary source i.e. CMIE Prowess database.

e) Application of statistical methods: The analysis and interpretation of data are done graphically through time-series and cross-sectional analysis of five selected merchant banks. Time-Series analysis is conducted for each of the five selected banks in respect of two components of each ratio for five years in the study period ranging from 2005 to 2009. Cross-Sectional analysis gives an indication of the relative performance of five banks in relation to the individual three ratio categories i.e. turnover ratio, liquidity ratio, return ratio for each of the five financial years from 2005 to 2009.

5. Analysis and Findings

The analysis and interpretation of available data for the sample banks are presented below through charts and graphs.

Time-Series Analysis

The graphical presentations in the form of line graphs for each bank with respect to each ratio category over five years ranging from 2005 to 2009 are shown below.

Turnover ratios (times)

For time series analysis of each selected bank over the study period, two components of turnover ratio i.e., Finished Goods Turnover and Creditors Turnover are selected.

Figure 1: INDBANK Merchant Banking Services Ltd.

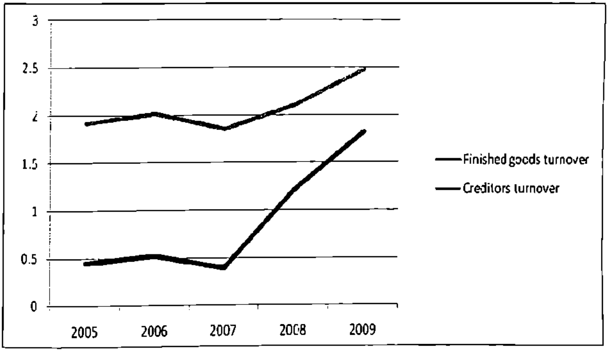


Figure 2: CANBANK Financial Services Ltd.

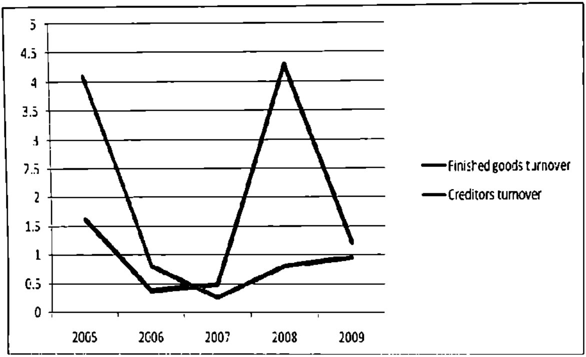


Figure 3: IDBI Capital Market Services Ltd.

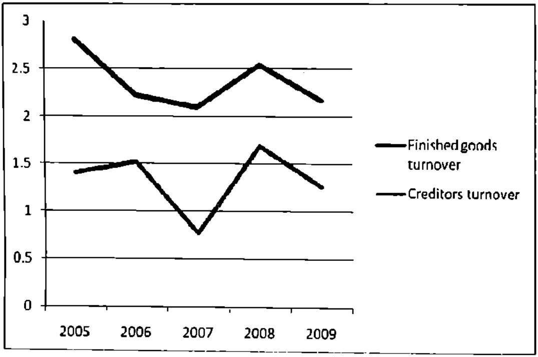


Figure 4: ICICI Securities Ltd.

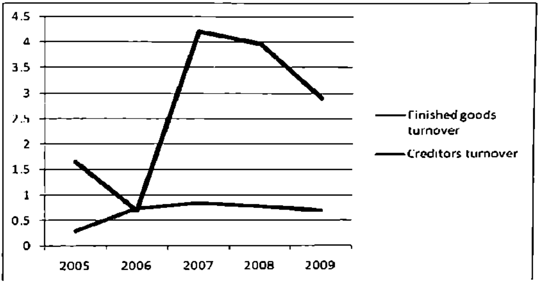
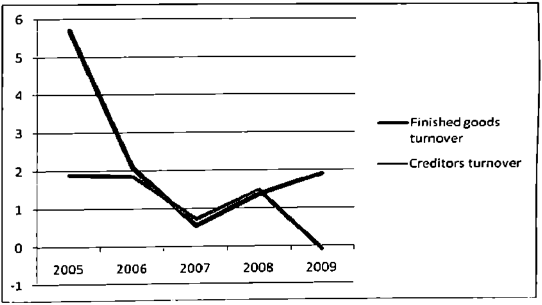


Figure 5: SBI Capital Markets Ltd.



Observations:

- As shown in Fig. 1, finished goods turnover has been highest in 2009 for INDBANK Merchant Banking Services Ltd. The line diagram shows that it has started increasing since 2008. Likewise, creditors' turnover has also been highest in 2009, and has increased in 2006, but fallen in 2007 and thereafter started rising from 2008.

- As shown in Fig. 2 for CANBANK Financial Services Ltd., finished goods turnover has been highest in 2008 but has fallen in 2006 and 2009, whereas creditors' turnover has been highest in 2005, but dropped significantly in 2006, and hovered around the same level up to 2009.

- As shown in Fig. 3, finished goods turnover has been highest in 2005 for IDBI Capital Market Services Ltd. The line diagram shows that it has fallen in 2006 and 2007, but increased in 2008 and has again fallen in 2009. On the other hand, creditors' turnover has been highest in 2008 with a rise and a fall between 2005 and 2007, and again a fall in 2009.

- In case of ICICI Securities Ltd. in Fig. 4, finished goods turnover has been highest in 2007, but has fallen in 2006 from 2005, increased in 2007 and again started decreasing in 2008 and 2009. Creditors' turnover has been highest in 2007, though low over the study period. It increased from 2005 but again decreased up to 2009.

- For SBI Capital Markets Ltd. in Fig. 5, finished goods turnover has been highest in 2005, but had a steep fall up to 2007 and increased marginally in 2008 and 2009. Creditors' turnover has also been highest in 2005. The line diagram shows that it has an alternate rise and fall since 2005 and has become negative in 2009.

Liquidity ratios (times)

Time-series analysis of selected merchant banks considers two components of Liquidity Ratios (in times) i.e., Quick Ratio & Current Ratio.

Figure 6: INDBANK Merchant Banking Services Ltd.

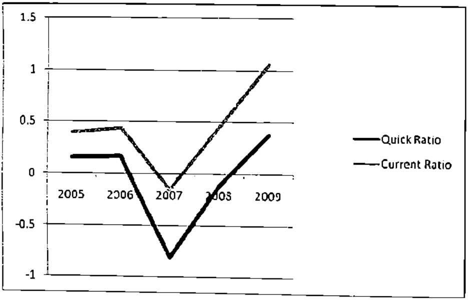


Figure 7: CANBANK Financial Services Ltd.

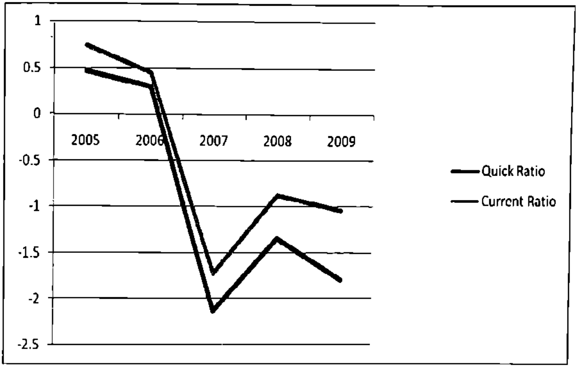


Figure 8: IDBI Capital Market Services Ltd.

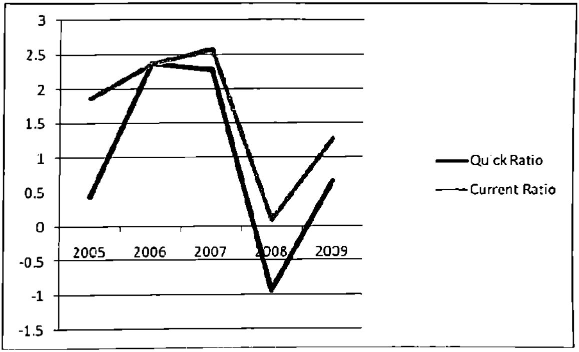


Figure 9 : ICICI Securities Ltd.

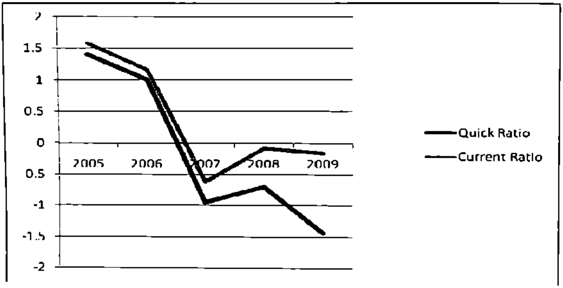
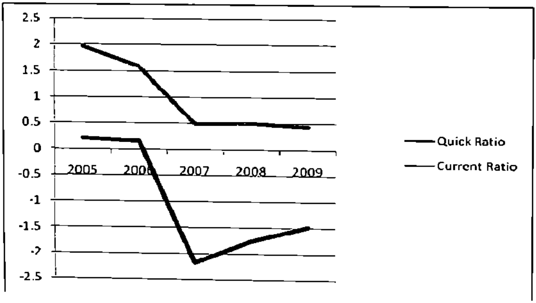


Figure 10 : SBI Capital Markets Ltd.



Observations:

- As shown in Fig. 6 on INDBANK Merchant Banking Services Ltd., both Quick Ratio and Current Ratio have behaved in a similar pattern and became highest in 2009. The line diagram shows that Quick Ratio has been more negative between the years 2006 to 2008 than Current Ratio.

- As shown in Fig. 7 for CANBANK, Quick Ratio as well as Current Ratio have been positive and highest in 2005 and thereafter became negative in all the last three years (2007-2009).
- In case of IDBI in Fig. 8, Quick Ratio has been highest in 2006, after rising from the level in 2005, but has fallen thereafter and has become negative in 2008, though again risen in 2009. Current Ratio has been highest in 2007 gradually rising from 2005, and thereafter reflected a similar trend as that of Quick Ratio.
- As shown for ICICI Securities in Fig. 9, Quick Ratio as well as Current ratio have been highest in 2005, reflected a fall and a similar trend thereafter, and have become negative in the last three years.
- As shown in Fig. 10 for SBI Capital Markets, Quick Ratio has been low in all the years of the study period and even became negative in the last three years whereas Current Ratio has been higher than Quick Ratio and became highest in 2005 but the curve is downward sloping thereafter.

Return ratios (%)

For time series analysis of each selected bank over the study period, two components of Return ratios (%) i.e., Profit before Interest and Tax (PBIT) / Average Total Assets and Profit after Tax (PAT) / Average Gross Fixed Asset (excluding revaluation and WIP) are selected.

Figure 11: INDBANK Merchant Banking Services Ltd.

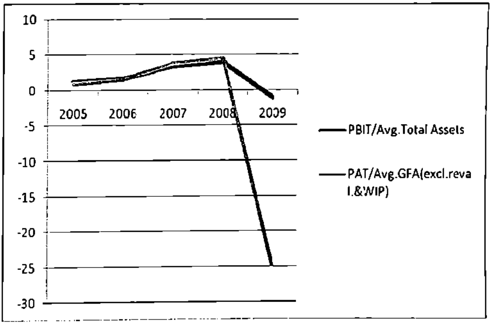


Figure 12: CANBANK Financial Services Ltd.

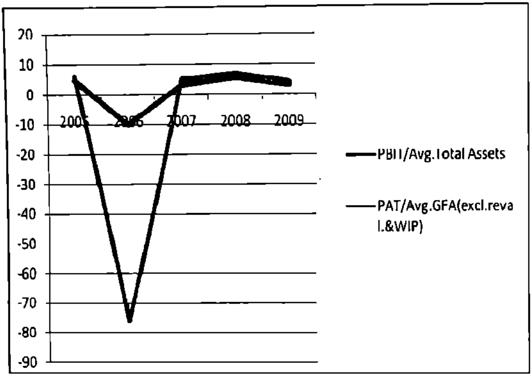


Figure 13: IDBI Capital Market Services Ltd.

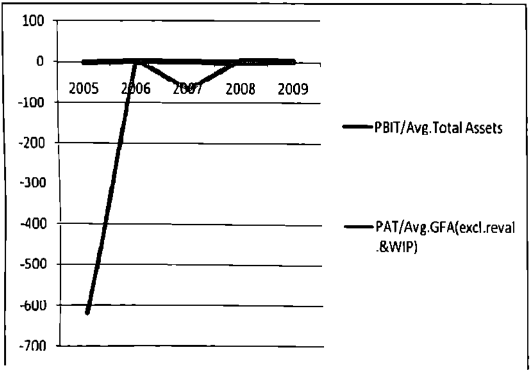


Figure 14: ICICI Securities Ltd.

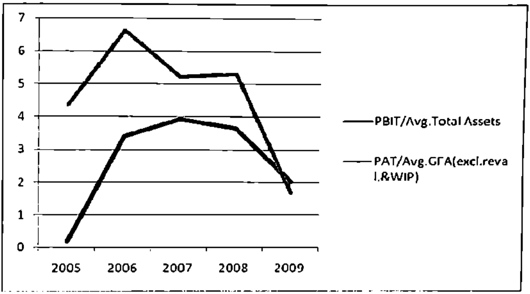
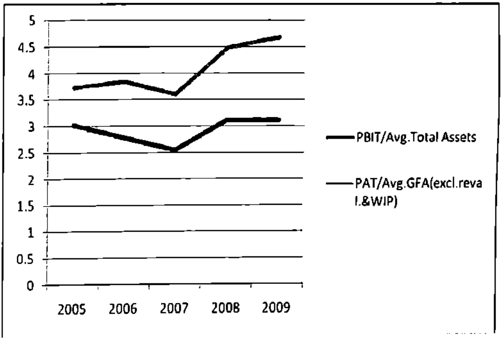


Figure 15: SBI Capital Markets Ltd.



Observations:

- As shown in Fig. 11 for INDBANK, PBIT/ Average Total Assets has been highest in 2008. The line diagram shows that it has increased from 2005 and has become highest in 2008 but has fallen thereafter and became negative in 2009. PAT / Average Gross

Fixed Asset (excluding revaluation and WIP) has been highest in 2008 after hovering around the same level as that of PBIT/Average Total Assets since 2005. The line diagram shows that PAT/Average GFA had a steep fall and became negative in 2009.

- As shown for CANBANK in Fig. 12, PBIT/ Average Total Assets has fallen steeply from 2005 and became negative in 2006. Thereafter it has risen in 2007 and became highest in 2008 and slightly decreased in 2009. PAT/ Average GFA has been mostly positive and highest in 2008, though it has been negative in 2006. However it slightly decreased in 2009.
- Fig. 13 for IDBI Capital Market shows that both the ratios have been significantly low and negative at times. PBIT/ Average Total Assets has been negative in 2005, though increased in 2006, and hovered around the same level in 2007, 2008 and 2009. PAT/Average GFA has shown a steep rise from a negative value in 2005, and thereafter has fallen again in 2007 and risen slightly in 2008 and 2009.
- As shown in Fig. 14 for ICICI Securities, PBIT/ Average Total Assets has been highest in 2007 but started falling thereafter whereas PAT/ Average GFA has been highest in 2006, and thereafter started decreasing from 2007.
- As shown for SBI Capital Markets in Fig. 15, PBIT/ Average Total Assets has been highest in 2008, though it has fallen in 2007. It has almost remained the same in 2009 as that in 2008. PAT/ Average GFA has been highest in 2009, and has mostly risen except a fall in 2007.

Cross-Sectional Analysis

In this form of analysis, the graphical representation in the form of bar diagrams portray the relative performance of the five banks with respect to each of the individual three ratio categories for each of the financial years from 2005 to 2009. The same two component ratios for each ratio category, as are used in time-series analysis, have been considered for such cross-sectional analysis. However, only the bar charts for the years 2005 and 2009 are shown for the sake of volume, and a summary analysis for all the years has been made.

Turnover ratios (times)

For cross-sectional analysis of each year over the study period, finished goods turnover and creditors turnover are plotted.

Figure 16: For the year 2005

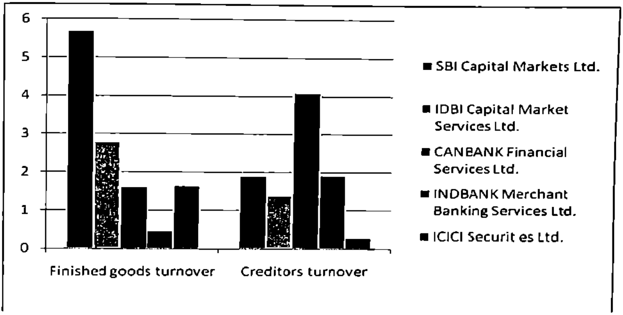
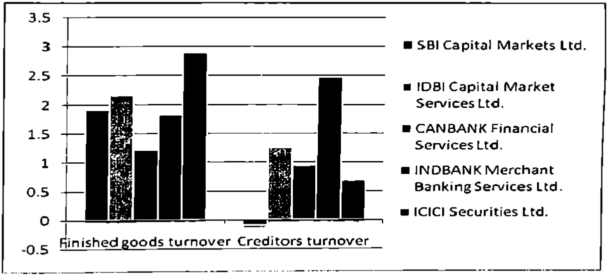


Figure 17: For the year 2009



Observations:

- As shown in Fig. 16, SBI Capital Markets Ltd. has the highest value in respect of finished goods turnover while CANBANK Financial Services Ltd. has taken the highest value in respect of creditor's turnover in comparison to the other four banks in 2005.

- As shown in Fig. 17, finished goods turnover is highest for ICICI Securities Ltd. while creditors' turnover is highest for INDBANK Merchant Banking Services Ltd. In 2009.

Liquidity ratios (times)

The following figures plot quick ratio and current ratio as components of liquidity ratios.

Figure 18: For the year 2005

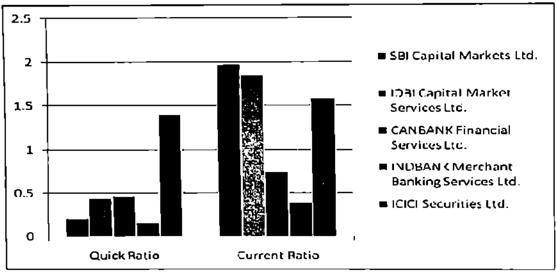
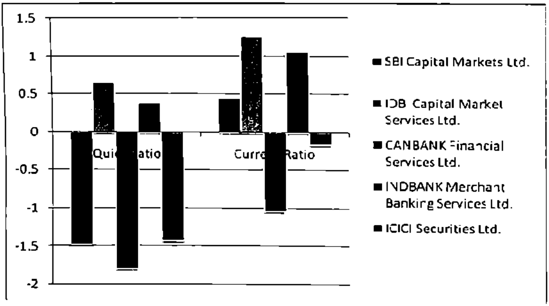


Figure 19: For the year 2009



Observations:

- As shown in Fig. 18, both the liquidity ratios, Quick ratio and Current ratio are positive for all banks in 2005. In case of Quick ratio, ICICI Securities Ltd. has been a better performer in comparison to the other four banks, whereas in case of Current ratio SBI Capital Markets Ltd. has been better.
- As shown in Fig. 19, Quick ratio is positive and highest for IDBI Capital Market Services Ltd. and INDBANK Merchant Banking Services Ltd. also has a positive value in 2009. In case of Current ratio, IDBI Capital Market Services Ltd., SBI Capital Markets Ltd. and INDBANK Merchant Banking Services Ltd. have positive values while IDBI Capital Market Services Ltd. has the highest value.

Return ratios (%)

For cross-sectional analysis of each year over the study period, the two components of return ratios - PBIT/ Average Total Assets and PAT/ Average GFA are plotted below.

Figure 20: For the year 2005

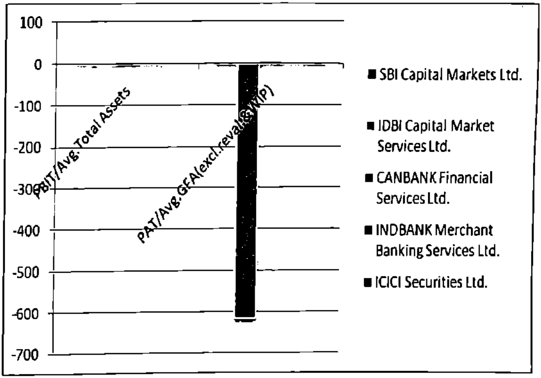
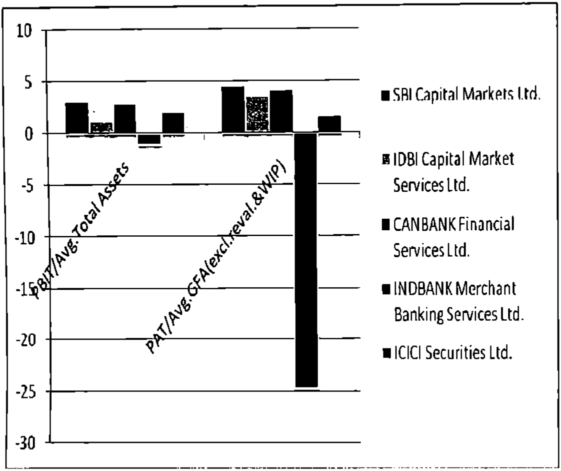


Figure 21: For the year 2009



Observations:

- As shown in Fig.20, all the banks have low values of PBIT/ Average Total Assets, while IDBI Capital Market Services Ltd. has a negative value in 2005. In respect of PAT/ Average GFA, again all the banks have low values with CANBANK Financial Services Ltd. having a higher value than other banks, while IDBI Capital Market Services Ltd. having a negative value.
- As shown in Fig.21, SBI Capital Markets Ltd. has a higher value in comparison to the other four banks in respect of PBIT/ Average Total Assets and PAT/ Average GFA in 2009, while INDBANK Merchant Banking Services Ltd. has a negative value for both the ratios.

Summary of Findings of Cross-sectional Analysis:-

Likewise, the cross-sectional analysis of the charts plotted for the years 2006, 2007 and 2008 are summarized in the table below :

Table 1: Summary of Cross-sectional analysis

Ratio Categories	2006	2007	2008
Turnover (times)	IDBI Capital Market Services Ltd. is highest with respect to Finished goods turnover whereas INDBANK Merchant Banking Services Ltd. has taken the highest value with respect to Creditors turnover.	ICICI Securities Ltd. has emerged as the best performer in respect of Finished goods turnover whereas INDBANK Merchant Banking Services Ltd. has performed better in case of Creditors turnover.	In respect of Finished goods turnover, CANBANK Financial Services Ltd. is the highest, though Creditors turnover is highest for INDBANK Merchant Banking Services Ltd.
Liquidity (times)	IDBI Capital Market Services Ltd. has clearly outperformed the other four banks.	Quick and Current ratios are the highest for IDBI Capital Market Services Ltd.	None of the sample banks has performed well in respect of Quick ratio. Whereas, SBI Capital Markets Ltd. has the highest value in case of Current ratio.
Return (%)	ICICI Securities Ltd. has a higher value.	ICICI Securities Ltd. has a higher value in comparison to the other four banks.	CANBANK Financial Services Ltd. has the highest value.

On an overall basis, CANBANK Financial Services Ltd. has performed well among all the sampled banks with respect to both cross-sectional analysis and time-series analysis. However, in respect of time series analysis, SBI Capital Markets Ltd. has emerged the second best performer while in case of cross-sectional analysis, both SBI Capital Markets Ltd. and IDBI Capital Market Services Ltd. have shown second best performance.

6. Conclusion

Merchant Banking in India was at its best during 1985-1992 when there were many new public issues on offer. But still some challenges are faced by merchant bankers such as SEBI guideline has restricted their operations to issue management and portfolio management only to some extent. So their scope of work is rather limited. Besides, poor new issues market in India has dried up the business of the merchant bankers. It is expected that coming years will be the best time for merchant bankers as many new issues are likely to come up.

The present study however suffers from the following limitations. Due to constraints in availability of data on financial parameters of merchant banks operating in India, the study is based on five selected merchant banks. Since the study concentrates only on a comparison of performance over the years (i.e. time-series analysis) and on relative performance (i.e. cross-sectional analysis) of select merchant banks in India, the causes of superlative or underperformance of such selected banks have not been investigated.

In spite of the above limitations, the present study assumes significance. One of the principal objectives of merchant banking is to enhance the shareholders' wealth by providing valuable advice on financial matters to the company. Accordingly, it can be said that financial performance of merchant bankers indirectly influences prosperity of companies. With this end in view, the present study has made an honest attempt to make a comparative analysis of performance of individual merchant banks with respect to three ratio categories over five years in the study period.

There are other aspects of merchant banking that can be researched. As for example, it has been mentioned that issue-management is one of the important service rendered by the merchant bankers. So an empirical study can be carried out to examine the procedure of issue management of merchant banks in different countries. The merchant banking operations in different countries vary depending upon the regulations implemented by the regulators of the country in which it is domiciled. Keeping in view the cross comparison among different countries, an effort can also be made to probe into the fact whether the convergence of merchant banking practices is possible.

'Private equity investing', regarded as 'Buyout investing' or 'Venture investing', taken up by many merchant banking financial institutions can be selected as a topic of research. Private equity investors make investments directly into private companies or conduct buyouts of public and private companies. The majority of private equity consists of institutional investors and accredited investors who can commit large sums of money for long periods of time.

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Performance of Diversified Equity Funds in India: A Study of Select Schemes of HDFC Asset Management Company

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Abstract: Mutual fund is a vehicle through which the funds of different investors are pooled and invested in different debt and equity instruments. It throws a challenge to the manager of the specific fund to invest the fund in a manner to bring out the best of returns for the investors. A lot of research regarding market and allied aspects and a sustained active fund management results in realization of returns for the unit-holders. From its inception in the early 1960s with a single player Unit Trust of India, the mutual fund industry, over the years, has become very competitive with the presence of a number of Fund Houses who offer a variety of funds to cater to the myriad investment objectives of investors. The funds are tailored to meet the risk appetite of various investors. SEBI with its various investor-friendly measures has instilled credibility of the above investment institution in the minds of general investors. The performance analysis of fund houses in general, and categories of funds cutting across fund houses in particular, are going on continuously in an endeavour to find out the more efficient funds and fund houses, so that investors can park their savings. In this paper, an attempt has been made to analyze the performance of a few funds belonging to HDFC fund house.

Key-words: Mutual fund, fund management, fund house, assets under management, performance analysis.

1. Introduction

A Mutual Fund is a trust that pools together the resources of investors and invests the same in securities in accordance with the objectives disclosed in the offer document. The investment in securities is spread across a wide cross-section of industries which help in reduction of risk. An investor, by investing in the units of any mutual fund, becomes the part owner of the assets of the fund. Investors in mutual funds are known as unit holders. Any mutual fund has to get it registered before it can collect funds from public. When the value of the Mutual Fund's investments goes up, the return of the investor goes up and vice versa. The funds are managed by the professionals trained in security analysis. Fund houses offer a wide variety of mutual fund schemes to suit the investors' risk appetite, return expectations, age etc. Open-ended funds have perpetual existence and a flexible corpus which is ever changing. Investors are free to buy and redeem any number of units of such funds at any point of time at the prevailing Net Asset Value (NAV). Therefore, there is always the possibility of withdrawals or redemptions. As a result, management of such funds has become one of the very challenging tasks. Equity Funds are those funds which invest predominantly in equity and equity related instruments. A mutual fund, in order to be classified as equity fund, must invest at least 65% in domestic (Indian) equity. Diversified equity funds invest in the stocks of companies across different sectors and industries. No single stock or sector dominates the portfolio. These funds are less risky because of adequate diversification. Some funds may invest entirely in large-cap stocks as a result of which liquidity increases and risk reduces further. Some funds may prefer to invest in large-cap as well as in mid-cap stocks, while some may take more risk by investing the major portion in mid-cap and small-cap stocks.

Worldwide, mutual fund has a long and successful history. The popularity of mutual fund in developed financial markets across the globe has increased manifold over the years. In India, the journey of mutual fund started in the year 1963 with the setting up of Unit Trust of India (UTI). Riding on favourable economic and demographic factors and investor-friendly regulatory environment, the mutual fund industry of India has witnessed phenomenal quantitative growth in terms of Assets under Management (AUM) which is depicted in Table 1 below.

Table 1: Growth in AUM over the Years

Month and Year	AUM (INR crore)	Month and Year	AUM (INR crore)
March, 1965	25	March, 2006	231862
March, 1987	4564	March, 2007	326388
March, 1993	47000	March, 2008	505152
February, 2003	87190	March, 2009	417300
March, 2003	79464	March, 2010	613979
March, 2004	139616	March, 2011	592250
March, 2005	149554	March, 2012	587217

Source: AMFI

AMCs that were able to maintain their bottom line green in the Financial Year 2011 have been shown in Table 2.

Table 2: Profit-making AMCs

AMC	AUM as on Dec 2011	Net Profit (INR crore) in FY2011	Net Profit (INR crore) in FY2010	Net Profit (INR crore) in FY2005	Accumulated Loss as on FY 2011 (INR crore)
Reliance	84300	261.27	195.13	132.95	-
HDFC	88737	242.18	208.37	129.11	-
UTI	57817	137.50	170.27	114.96	-
BSL	60406	84.54	48.45	9.27	-
SBI	42108	78.85	75.87	68.95	-
ICICI Prudential	69472	71.83	128.03	0.71	-
DSPBR	30565	46.90	51.26	40.78	-
Tata	21473	17.14	32.44	26.87	-
Sundaram	14775	13.36	20.84	10.68	-
Deutsche	13314	11.44	49.67	16.36	-
Kotak	30203	10.62	65.51	10.33	-
Canara Robeco	7356	6.11	6.29	-17.18	-
Quantum	179	4.94	3.47	0.17	-
Goldman Sachs	4349	2.11	-3.51	1.53	-
Taurus	4600	0.04	2.11	-9.91	-1.17
Franklin Templeton	37312	-	96.95	58.72	-

Source: Mutual Fund Insight, Feb 15-Mar 14, 2012, p22

Other AMCs were in the red so far as net profit for the Financial Year 2011 is concerned.

2. Review of literature

Several studies were conducted over the years on different aspects of mutual funds by academicians, researchers, regulators and committees. Moreover, many scholarly books and articles have been published over the years on different dimensions of mutual funds. The existing literature can be reviewed under two groups: (a) Review of Indian Literature; and (b) Review of Foreign Literature.

(a) Review of Indian Literature: Numerous works have been done in the area of performance evaluation of mutual funds in India. The study of Barua et al (1991) on performance evaluation of "Master Share" scheme of UTI was really a pioneering attempt in the field of research on the evaluation of performance of mutual funds in India. The period of study was from 1987 to 1991. The findings of the study revealed that "Master Share" scheme performed better in terms of systematic risk, but not in terms of total risk. Batra and Bhatia (1992) tried to analyze the performance of mutual funds on the basis of return and funds mobilized. The performances of Canbank MF, Indian Bank MF and PNB MF were appreciated by the authors. Kaura and Jayadev (1995), while examining the performance of growth-oriented schemes using Jensen, Treynor and Sharpe measures; found that these schemes have not performed well at all. Yadav and Mishra (1996) evaluated the performance of 14 close-ended schemes against the benchmark of BSE National Index. Their study period was from April, 1992 to March, 1995. The authors concluded that these schemes performed well so far as diversification and total risk were concerned, but they failed to provide adequate risk-premium per unit of systematic risk. While examining the performance of two schemes (Mastergain 1991 of UTI and Magnum Express of SBI Mutual Fund), Jayadev (1996) found unsatisfactory diversification and insignificant selectivity and timing skills of the schemes. Chander (2000) studied the performance of 34 mutual fund schemes from January, 1994 to December, 1997 and observed that open-ended schemes outperformed close-ended schemes in terms of returns; growth and balanced funds were outsmarted by income funds; and fund managers had poor market timing abilities. Rao and Ravindran (2003) have found that most of the mutual fund schemes were able to satisfy investor's expectations by giving excess returns over expected returns based on both premium for systematic risk and total risk. Sharath (2004) examined the performance of 58 mutual fund schemes during the bear period (September, 1998 to April, 2002). Risk-return parameters indicated high total risk but low unsystematic risk. Elango (2004) made a comprehensive study on public sector and private sector mutual funds. Analytical results indicated that public sector funds showed low volatility than private sector funds. In terms of innovative schemes, private players were ahead of public sector ones. Muthappan and Damodharan (2006) evaluated the performance of 40 mutual fund schemes during the period from April, 1995 to March, 2000. It was revealed that most of the chosen schemes were able to outperform the market in terms of returns but they lagged behind the returns generated by 91-day treasury bills. The average risk of the schemes was also higher than the market. Rustagi (2007) found that mutual funds have the potential to beat inflation on a consistent basis. However, Chander (2005) and Sehgal and Jhanwar (2008) have noticed significant evidence of stock picking abilities of Indian fund managers. Tripathy (2008) used Jensen and Mazuy model and Henriksson and Merton model

in evaluating the market timing abilities of Indian mutual fund managers. The findings of the study revealed that the fund managers were not able to generate returns in excess of the market, and in some cases, their market timing was in the wrong direction. Shitole and Thyagarajan (2012) have also evaluated the performance of the schemes of three AMCs, namely, ICICI Prudential AMC, HDFC AMC, and Franklin Templeton AMC. On the whole, the authors are of the opinion that most funds were able to provide market related returns, and many schemes outperformed their respective benchmark indices.

(b) Review of Foreign Literature: Sharpe (1966), on the basis of his famous reward-to-variability ratio (popularly known as Sharpe ratio), evaluated the performance of 34 open-ended mutual funds and his study period was from 1944 to 1963. He concluded that the performance of mutual funds, on an average, was inferior to an investment in the Dow Jones Industrial Average (DJIA). He also observed that good performance of the funds was very much associated with low expense ratio. But no significant relationship was found between the fund size and its performance. Treynor and Mazuy (1966), while examining the performance of 57 mutual funds, did not find any statistical evidence that fund managers were able to anticipate the market movements in advance and opined that it was the ability of fund managers to identify under-priced stocks which could improve the rate of return of the funds. Jensen (1968) examined the performance of 115 mutual funds and concluded that there were no statistical evidences which can prove that the fund managers were able to forecast the prices of securities well enough to recover fees and research expenses. Friend and Vickers (1970) evaluated the performance of mutual funds against randomly constructed portfolios. The authors found that mutual funds, on the whole, have not showed any superior performance than the random portfolios. Friend et al (1970) studied the performance of 86 mutual funds and found no correlation between fund size and performance and that's why they concluded that the fund size has no impact on the performance of the funds. Kon (1983), while evaluating the performance of 37 funds during the period from January, 1960 to June, 1976, came up with the findings that collectively mutual funds failed to perform satisfactorily though individually a few funds showed timing skills and positive selectivity. Ippolito (1989), after analyzing the performance of 143 mutual funds during the period between 1965 and 1984, opined that the superior performance of the mutual funds was offset by expenses and loads associated with mutual funds, in the presence of costly information. Cai and Yamada (1997) conducted a study on 1151 open-ended mutual funds during the period from 1981 to 1992 and opined that most of these funds underperformed their respective benchmarks by 3.6% to 10.8% per year. Statman (2000) examined carefully the performance of socially responsible stocks and funds over the period between 1990 and 1998 and both groups of mutual funds (socially responsible funds as well as traditional funds) trailed the S&P 500 Index. Dahlquist et al (2000), in their study on 210 mutual funds during the period between

1992 and 1997, found that small equity funds, low fee funds, and in some cases, fund with good past performance managed to show good performance. Barras et al (2008) found that during the period between 1975 and 2006, 26.6% of equity funds showed negative alpha (net of expenses and trading costs) whereas only 0.6% of the funds exhibited positive alpha. One of the important conclusions that can be inferred from their study is that the proportion of truly skilled funds was very low in spite of tremendous growth in the number of actively managed funds.

To sum up, literature review of other countries in the area of evaluation of performance has revealed that market timing abilities and stock selection capabilities of mutual fund managers, on an average, are really poor and funds are not able to outperform the broader market on the whole in the long-term. The bottom line is that the markets are reasonably efficient.

Research Gap

It may be observed from the above review of literature that no study has been found to be made on the performance of the diversified equity funds of HDFC Fund House though it has the highest amount of assets under its management (AUM) as on 31.03.2012. Therefore, the present study has made an attempt to focus on this important aspect.

3. Objective of the Study

The main objective of the study is to analyze the performance of the select open-ended diversified equity schemes of HDFC Asset Management Company (AMC) in the line of risk-return parameters.

4. Data and Methodology

Many fund houses operate in the mutual fund industry in India and of them HDFC has the highest amount of Asset Under its Management (AUM) as on 31st March, 2012. The retail scheme of each of the four funds from the HDFC Fund House- HDFC CAPITAL BUILDER, HDFC TOP 200, HDFC GROWTH and HDFC EQUITY, which are in the market for more than ten years, has been selected for the study. The effect of 'Entry Load' has not been taken into consideration. The period of study is a five-year time frame starting from April 2007 to March 2012. The month end NAVs, under Growth option, of each Fund have been obtained from the official website of the fund house. The month end closing values of the respective benchmark of the funds (fixed by the fund house for each fund) have been obtained from the official website of Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). The monthly returns of the four funds and their benchmarks over the period of study have been computed with the help of MS Excel. The weighted average 91-day T-Bill rates (obtained from the official website of the Reserve Bank of India) for each year under study has been averaged to arrive at the Risk Free Rate of Return. The risk free rates, annualized return of the funds and their benchmarks have been used in many measures, through which the performances of the funds have been evaluated and compared.

5. Analysis of Performance of the Selected Schemes

Before analyzing the performance of the chosen schemes, it is worthwhile to look into some key portfolio statistics of the schemes (Table 3).

Table 3: Portfolio Snapshot

Fund/Scheme	AUM (INR crore) *	Launch Date	Expense Ratio	Equity (%)	Debt (%)	Cash (%)
HDFC Capital Builder	481	01/1994	2.23	98	0.2	1.8
HDFC Equity	9916	12/1994	1.78	98.9	0.5	0.7
HDFC Growth	1262	08/2000	1.98	95.9	2	2.1
HDFC Top 200	11381	09/1996	1.77	98.3	1.3	0.4

Source: Mutual Fund Insight, April 15-May 14, 2012

*AUM as on 31/03/2012

It is interesting to note that there exists inverse relationship between the fund size and its expense ratio. Further, all the schemes are tilted heavily towards equity having more than 95% equity component. Debt and cash components are very much negligible.

Annual returns generated by the schemes and their respective benchmarks are shown in Table 4.

Table 4: Annual Returns of the Schemes and Benchmarks

Scheme & Benchmark	Return in 2008 (%)	Return in 2009(%)	Return in 2010 (%)	Return in 2011 (%)
HDFC Capital Builder	(54.89)	92.91	28.44	(23.64)
S&P CNX 500	(57.13)	88.57	14.13	(27.19)
HDFC Equity	(49.68)	105.57	29.22	(26.72)
S&P CNX 500	(57.13)	88.57	14.13	(27.19)
HDFC Growth	(48.31)	75.26	27.71	(21.24)
Sensex	(52.45)	81.03	17.43	(24.64)
HDFC Top 200	(45.35)	94.46	25.05	(24.30)
BSE Top 200	(56.46)	88.51	16.22	(26.95)

Note: Calculated from year-end values, bold figures indicate schemes, figures in the parentheses indicate negative return

Three schemes (HDFC Capital Builder, HDFC Equity, and HDFC Top 200) outperformed their respective benchmarks in terms of annual returns for all the years from 2008 to 2011. The other scheme (HDFC Growth) managed to outperform its benchmark in 3 out of 4 years (2008, 2010, and 2011).

Table 5: Return and Volatility Measures

Measures	HDFC Capital Builder		HDFC Equity		HDFC Growth		HDFC Top 200	
	5-yr	3-yr	5-yr	3-yr	5-yr	3-yr	5-yr	3-yr
Portfolio Return (Rp) (%)	11.20	27.25	12.14	29.24	12.62	26.38	13.12	25.91
Standard Deviation of Portfolio Returns (SDp)	28.67	22.02	30.29	25.37	27.36	22.57	28.34	24.10
Return of the Benchmark Market Index (Rm) (%)	5.89	20.32	5.89	20.32	5.72	19.46	6.53	21.26
Standard Deviation of the Benchmark Market Index (SDm)	32.71	26.25	32.71	26.25	29.82	25.20	32.25	25.98
Beta(slope)	0.86	0.81	0.91	0.94	0.89	0.87	0.87	0.92
Sharpe Ratio(Portfolio)	0.12	0.88	0.14	0.84	0.17	0.82	0.18	0.75
Treynor Ratio	3.86	23.79	4.69	22.61	5.32	21.28	6.00	19.64
Jensen Alpha	5.02	9.25	6.06	9.61	6.65	8.44	6.41	5.76
Sharpe Ratio(Benchmark)	-0.06	0.47	-0.06	0.47	-0.07	0.46	-0.04	0.51
Fama	5.06	8.94	6.11	9.33	6.72	8.13	6.42	5.63
R-Squared	0.95	0.94	0.96	0.95	0.94	0.94	0.98	0.98
Adjusted R-Squared	0.95	0.94	0.95	0.95	0.94	0.94	0.98	0.98

Note: Calculation done by the authors

Table 5 shows that HDFC Equity has the best 3-year annualized portfolio return figure while Benchmark Market Index 'BSE 200' has performed the best among other similar market indices during the same period. HDFC Top 200 has the highest portfolio return (annualized return for 5 years) while the 'BSE 200' continues to be the best performer, among the benchmark market indices, in the 5 year time frame also. R-squared values of all the funds are close to 1 which signifies that the beta of the funds can be relied upon. All the funds have beta less than one indicating that they are defensive in nature and imitate the variance of the market returns to a great extent. While measuring the reward to total variability, Sharpe Ratio of the different funds show that HDFC Capital Builder (in the 3-year time frame) and HDFC Top 200 (in the 5 year time frame) have performed better than the rest while the benchmark market index of the funds have returned negative values for the same ratio in the 5-year time frame. HDFC Top 200 has the highest Rp and Sharpe Index in the 5-year time frame which is a win-win situation. The fund has the best reward to variability trade off. Treynor Index measures the ratio of risk premium to the portfolio beta. Here again HDFC Top 200 has the best result in the five year time frame. HDFC Capital Builder as a fund performed very well between April 2007 and March 2010 but somehow lost its way in the later two years. Ranking of the portfolios under both Sharpe and Treynor Measure are the same in the 3-year and 5-year time frame which means that the funds have more or less same degrees of diversification. The positive values of Jensen Alpha of the different funds show that the fund managers are efficient in selecting undervalued assets. Fama's measure of net or pure selectivity of portfolio (Khan & Jain, 2006) returns positive values for all the funds which means that the risk-return trade-off of the funds are well balanced and the fund managers have proper asset selection skills.

There are four possibilities as shown in Table 6.

Table 6: Risk-Return Possibilities

Possibility	Rp, Rm	SDp, SDm	Risk	Return	Situation
1	Rp>Rm	SDp>SDm	High	High	Aggressive
2	Rp>Rm	SDp<SDm	Low	High	Best/Most desirable
3	Rp<Rm	SDp<SDm	Low	Low	Conservative
4	Rp<Rm	SDp>SDm	High	Low	Worst

All the schemes under study satisfy the best possible criterion (Low Risk-High return).

The annualized 'SIP' returns of the funds are presented in Table 7.

Table 7: Annualized Return from Systematic Investment Plan (SIP)

Fund/Scheme	3-year SIP Return (%)	5-year SIP Return (%)
HDFC Capital Builder	7.25	10.98
HDFC Equity	7.14	12.96
HDFC Growth	8.36	11.16
HDFC Top 200	6.19	11.88

Note: Calculation done by the authors assuming investment of INR 1000 in each month on closing NAV for 36 months and 60 months respectively.

If we compare the SIP return figures with those of average annualized returns, it is seen that the former outperformed the latter in case of one scheme (HDFC Equity) in terms of 5-year returns. Further, though 5-year SIP returns from the other three schemes (HDFC Capital Builder, HDFC Growth and HDFC Top 200) are less than those of average annualized returns, the difference in return is not very high. But, so far as 3-year returns are concerned, SIP returns lagged way behind its counterpart. However, 5-year SIP returns of all the funds are more than 5-year annualized risk-free return (7.896%). But in 3-year period, only HDFC Growth has been able to generate more SIP return than 3-year annualized risk-free rate (7.89%).

6. Limitations of the Study

- The study involves analysis of funds from only one Asset Management Company, i.e., HDFC Asset Management Company. The mutual fund industry has many of such AMCs who keep the market competitive.
- The study involves only four funds while the industry has hundreds of such funds managed by different AMCs.
- The period of study involves a three year and a five year time frame ending on March 2012 while the funds are in existence for much more than the chosen time frame.
- The study has considered few measures to evaluate the performance of the chosen mutual funds. There are many more measures with their specific interpretations to evaluate the performance of mutual funds.

7. Significance of the Study

The findings of the study are expected to provide a basis for understanding the performance of open-ended diversified equity funds chosen for the purpose of study and it is expected to assist and encourage researchers and organizations to undertake similar study for the benefit of the investors in general and retail investors in particular.

8. Conclusion

Investment in securities like shares or debentures always involves risk. Overall economic scenario, performance of the company or industry, political environment, efficiency of capital market, regulatory mechanisms etc. are the different influencing factors in this respect. Mutual funds too invest in the securities and thus face market risks. It is true that risk cannot be eliminated but it can be reduced with the help of diversification and professional management. The mutual funds under study are the examples of investment products that reduce risk by building a basket of well diversified securities, which may be considered as suitable for the common man.

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Exchange Traded Funds Vis-Á-Vis Index Funds in India – A Comparative Study

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Abstract: Exchange Traded Funds (ETFs) are baskets of securities that are traded like individual stocks on an exchange. Most ETFs charge lower annual expenses than Index Mutual Funds. However, as with stock, one must pay brokerage to buy and sell ETF units, which can be a significant drawback for those who trade frequently or invest regular sums of money. An index fund is a mutual fund which invests in securities in the index on which it is based such as BSE Sensex or S&P CNX Nifty in India. It invests only in those shares which comprise the market index and in exactly the same proportion as the companies/weightage in the index so that the value of such index funds varies with the market index.

The present study has been undertaken to evaluate the performance of ETFs and Index Funds in India and compare ETFs with Index Funds in India. The performance evaluation parameters which have been used in this study are Net Asset Value (NAV), Risk, Return, Expense Ratio, Tracking Error, Reward to Variability and Differential Return. The statistical tools like Standard Deviation, Beta, Alpha, R-squared and Sharpe Ratio are used for data analysis.

It is found that ETFs have given better opportunity for the small investors in terms of diversified portfolio with a small amount of money, low expense ratio, reduced tracking error, lower risk and volatility as compared to Index Funds. The ETFs can become a better alternative, provided awareness is created among investors.

Key-words: Mutual funds, exchange traded funds, index funds, net asset value.

1. Introduction

Exchange traded funds (ETFs) are a hybrid of open-ended mutual funds and listed individual stocks. They are Index Funds listed on the stock exchanges and traded like individual stocks on the stock exchange. However, trading at the stock exchanges does not affect their portfolio. ETFs do not sell their shares directly to investors for cash. The shares are offered to investors over the stock exchange. ETFs are passively managed funds that track a particular index such as S&P CNX Nifty (Standard & Poor's CRISIL NSE Index 50). Since they are open-ended and listed on stock exchanges, it is possible to buy and sell them throughout the day and their price is determined by the demand-supply forces in the market. In practice, they trade in a small range around the value of the assets (NAV) held by them.

An Index Fund is a mutual fund which invests in securities in the index on which it is based such as BSE (Bombay Stock Exchange) Sensex or S&P CNX Nifty in India. An index fund/portfolio consisting of all shares comprised in the index in the same proportion is known as a Fully Replicated Index Fund. An Index Fund, in contrast, invests only in shares included in the index. An Index Fund closely replicates the composition as well as the return on the index and follows the swings of the stock market.

In India, Index Fund mirrors the major market index like Nifty or Sensex as closely as possible by investing in all the stocks that comprise in proportions equal to the weightage of those stocks in the index. A few Index Funds were launched in the recent past to reduce the bias of fund managers in stock selection and to provide a return at par with the index. Some of the Index Funds based on S&P CNX Nifty are UTI Nifty Fund, Franklin India Index Fund and IDBI Principal Index Fund, etc.

The present study looks into the matter of these two passively managed index based funds-ETFs and Index Funds. Section 2 discusses the review of literature for justifying the present study. Section 3 describes objectives of the study. Section 4 deals with the database and research methodology. Trends and progress of ETFs and Index Funds are discussed in section 5 while section 6 provides performance evaluation of ETFs and Index Funds. Section 7 outlines the findings of the study. Finally, section 8 concludes the present study.

2. Review of Literature

Academicians, analysts and other stakeholders have analyzed mutual funds in different aspects. A few of such literature are discussed below.

Sadhak (2003) has made a detailed study on mutual fund industry in India as well as abroad and examined the domestic mutual funds industry, the changes with respect to products, distribution and delivery system, the spheres of investment management and regulations, corporate governance, investor protection, and SEBI guidelines etc. Sahadevan and Thiripalraju (1997) have made a detailed evaluation of income generated and expenses incurred by mutual funds in India and summarized the performance of various funds vis-à-vis the market. Gupta (2002) has examined the issue of market timing abilities of Indian mutual fund manager and examined the structural changes that have taken place in the Indian mutual fund industry. Singh (2006) has showed the enormous growth of mutual fund industry in India since its inception in 1963 compartmentalizing it into pre-liberalization and post liberalization era. He attempted to analyze the important issues confronting the investor like preference for different investment avenues. He also showed the performance of a sample of equity diversified and sector specific mutual fund.

Jaydev (1996) has evaluated the performance of two growth oriented mutual funds (Mastergain and Magnum Express) on the basis of monthly returns compared to benchmark returns. He found that Mastergain has performed better according to Jensen and Treynor measures but on the basis of Sharpe Ratio its performance was not upto the benchmark. Richard A. Ferri (2007) has explained market index and mutual funds. He also categorized the broad spectrum of index funds based on type and style worldwide. Richard A. Ferri (2008) has provided a detailed information about different types of ETPs (Exchange Traded Products), including ETFs, exchange-traded notes (ETNs), grantor trusts, and unit investment trusts (UITs). He also explored the latest ETF strategies from buy, hold and rebalance to market timing and sector rotation. Scott P. Frush (2011) has discussed the important basics of ETFs, followed by a detailed description of the different types of ETFs available in the marketplace worldwide. He concentrated on how best to employ ETFs in managing portfolio in addition to presenting peripheral topics relating to ETFs such as investing risk and return and asset allocation principles.

Hill and Muller (2001) have summarized that tracking errors and returns based on fund NAV relative to the index reflect some factors characteristic of the product structure. In addition, price –to-index returns and tracking error reflect ETF prices that are captured at different time from the underlying index and short supply and demand factors relevant to the ETF, as well as the hedging instruments used by marketers. NAV tracking error is much lower than price-to-index tracking error and is the most useful measure in assessing the long-term characteristics of an ETF relative to its underlying index. Chakraborty (2003) has examined various aspects of exchange-traded ADRs (American Depository Receipts) from India, considering the ten ADRs of Indian origin that currently trade on the American Stock Exchanges and also have the underlying stocks trading on Indian houses, and studied the extent to which the usual predictions about ADR returns hold for this important type of cross-border securities. Philip (2003) has explained the risk and return relationship of active portfolios in terms of value at risk on tracking error volatility (TEV), which can also be interpreted in terms of value at risk. Such a constrained portfolio is the typical setup for active managers who are given the task of beating a benchmark. The study reflected that TEV-constrained portfolios are described by an ellipse on the traditional mean-variance plan.

However, no such documented work is available on the comparative study of ETFs and Index Funds.

3. Objectives of the Study

The present study has been undertaken to:

(i) analyze the trends and progress of ETFs and Index Funds in India;

(ii) evaluate the performance of ETFs and Index Funds in India, and

(iii) compare ETFs with Index Funds in India.

4. Database and Research Methodology

The study is purely based on secondary data and in research methodology various statistical tools, models etc., are used. These are discussed below:-

4.1 Database

In order to make a comparative evaluation of the performance of ETFs and Index Funds, the study considers the top 5 Equity ETFs and Index Funds respectively for the last 5 years (2006-2010) from www.mutualfund.com. However, for the purpose of analyzing the trends and progress of Index Funds and ETFs in India, the data are collected since their inception respectively and considers Gold ETFs to some extent.

The secondary data sources include Fact Sheets of Mutual Funds, articles, SEBI manuals, AMFI reports and websites. The study has used the Government Bond yields issued by Government of India as the proxy risk free return which is computed to be 8.01% p.a. and the data has been collected from www.tradingeconomics.com. Annual returns and market return of respective funds have been collected from www.valueresearchonline.com and other data are collected from the following websites: - www.mutualfundindia.com, www.monycontrol.com, www.nse-india.com.

4.2 Research Methodology

The data are analyzed with the help of statistical measures like Standard Deviation, R-square, Beta and the parameters used for evaluating the performance are Net Asset Value, Risk, Return, Reward to Variability (Sharpe), and Differential Return (Alpha), Expense Ratio, Tracking Error.

5. Trends and Progress of ETFs and Index Funds

The Mutual Funds are a fast growing sector of the Indian financial markets. They have become a major vehicle for mobilization of savings, especially from the small and household savers for investment in the capital market. Mutual Funds entered the Indian capital market in 1964 with a view to providing the retail investors the benefit of diversification of risk, assured returns and professional management. Since then, they have grown phenomenally in terms of number of funds, size of operation, investor base and scope. With the ushering in of economic reforms in the early 1990s, the Government of India opened the way for the entry of private sector and foreign players into this industry. In India, the Mutual Fund Industry came into being with the establishment of Unit Trust of India in 1964. Public sector and foreign institutions were allowed to set up Mutual Funds in 1993. Mutual Funds have come forward with varying schemes suitable to the needs of the saving populace. By March 2010, there were 42 Mutual Fund Houses in India with Average Assets Under Management (AAUM) of Rs.7,47,33,862.61 lakhs.

5.1 Exchange Traded Funds in India

ETFs are the new products from the Mutual Fund Houses and are also slowly gaining popularity. They have huge potentiality to grow in India because of their technical advantages over traditional Mutual Funds. Gold ETFs are also gaining popularity from the last one year. Once the equity market stabilizes, the Fund Houses are ready to start new kind of product in this area. By March 2010, the total AAUM of ETFs approximately was Rs. 2,39,689.34 lakhs. The Gold Benchmark Exchange Traded Scheme (Gold BeES) was having the highest average AUM of Rs.76092.63 lakhs followed by Nifty Benchmark Exchange Traded Scheme-Nifty BeES with a sum of Rs.40776.19 lakhs. The total proportion of ETFs in the total sum of Mutual Fund sector was very low i.e. 0.32%.

5.2 Index Funds in India

An Index Fund is a Mutual Fund scheme that invests in the securities of the target index in the same proportion weightage. By March 2010, the total AAUM of Index Funds was Rs.1,19,027.23 lakh. The UTI- Nifty Index Fund- Growth Option was having the highest AAUM i.e. Rs. 17906.96 lakh followed by the other Index Funds. The LIC Mutual Fund Company is offering various types of Index Mutual Funds. The proportion of Index Funds in total AAUM of all funds was very low i.e. 0.16%.

It can be observed that the funds mobilized by ETFs (Rs.2,39,689.34 lakhs) is much higher than the funds mobilized by Index Funds (Rs. 1,19,027.23 lakhs). The total amount mobilized by these two funds represents 0.32% and 0.16% respectively of the total AAUM of Mutual Funds as on 31.12.2010.

5.3 Trends in ETFs and Index Funds in India

The recent explosion of investors' interest in ETFs and Index Funds in the developed market can be explained in part by the retail investors' increased understanding of inherent advantages relative to the traditional Mutual Funds and growing popularity of indexation as a core investment strategy. Table-1 shows the trends of ETFs and Index Funds in India.

Table-1: Trends in ETFs and Index Funds in India

Year	Equity ETF	Gold ETF	Index Funds	Total
1998	--	--	1	1
1999	--	--	1	1
2000	--	--	3	3
2001	1	--	--	1
2002	--	--	7	7
2003	1	--	5	6
2004	1	--	1	2
2005	--	--	--	--
2006	--	--	--	--
2007	2	4	--	6
2008	2	1	2	5
2009	1	1	--	2
2010	3	2	4	9
Gr. Total:	**11**	**8**	**24**	**43**

Source: AMFI

From Table-1, it is found that the first Index Fund was launched on 1st July 1998 (UTI Master Index Fund) and the first Equity ETF was launched in 2001 (Nifty BeES). More Index Funds have been issued in the years 2002 and 2003. The Gold ETFs are introduced in the year 2007 (Gold BeES) and the recession in the capital market and the growth rate in the prices of Gold led to the introduction of more Gold ETFs in India. There are at present 641 mutual funds schemes operating in India and the share of both the Index Funds and ETFs is very small i.e. 43 schemes accounting for 6.71% of the total.

6. Performance Evaluation of ETFs and Index Funds

The performance evaluation of ETFs and Index Funds is made with the help of select parameters viz., Return, Risk and Expense Ratio.

6.1 Returns of ETFs and Index Funds in India

ETFs have been gaining investors' interest. ETFs are essentially Index Funds that are listed and traded on exchanges like stocks. They enable the investors to get broad exposure to the stock markets in different countries and specific sectors, with relative ease, on a real-time basis. This also comes at a lower cost than many other forms of investments. Tables-2 and 3 give details relating to the returns of the selected ETFs and Index Funds (top 5 funds respectively for last 5 years as per www.mutualfundindia.com) during the period 2006-2010.

Table-2: Annual Returns of Exchange Traded Funds as on 31st December (Figures in %)

Sl. No.	Name of Fund	2006	2007	2008	2009	2010	Average
1.	Bank BeES	33.62	65.34	-48.63	77.78	31.37	31.90
2.	Junior BeES	28.63	75.12	-63.26	122.70	17.83	36.20
3.	S&P CNX Nifty BeES	41.18	55.83	-50.73	75.45	19.36	28.21
4.	Nifty BeES	41.49	55.97	-51.28	74.57	18.78	27.91
5.	ICICI SENSEX Pru. ETF	47.69	46.78	-51.12	78.41	18.77	28.11
Average		38.52	59.81	-53.00	85.72	21.22	

Source: Value Research

Table-3: Annual Returns of Index Funds as on 31st December (Figures in %)

Sl. No.	Name of Fund	2006	2007	2008	2009	2010	Average
1.	HDFC Index Fund-Sensex Plus Plan	44.83	41.69	-53.91	75.06	17.56	25.05
2.	ICICI Pru. Index Fund	41.94	46.46	-50.36	75.57	18.73	26.47
3.	Franklin India Index Fund-NSE Nifty Plan	40.19	54.00	-52.07	75.32	17.98	27.08
4.	UTI Nifty Fund- Growth	40.72	53.58	-51.96	73.80	17.73	26.77
5.	Franklin India Index Fund- BSE Sensex	43.74	46.61	-51.46	79.83	17.79	27.30
Average		42.28	48.47	-51.95	75.92	17.96	

Source: Value Research

It is observed from Table- 2 that all the ETFs are generating positive returns during the year 2010, though these are comparatively lower than the immediately preceding year 2009. Bank BeES generated the highest return i.e., 31.37 percent among all the ETFs in the year 2010 followed by S&P CNX Nifty BeES. The returns of all the ETFs are positive in all the years except in 2008 due to financial crisis during that period.

From Table-3 it is found that all the Index Funds are generating positive returns in the year 2010, though these are comparatively much lower than the immediately preceding year 2009. ICICI Pru. Index Fund generated the highest return i.e., 18.73 percent among all the Index Funds in the year 2010 followed by Franklin India Index Fund- NSE Nifty Plan. It is observed that all the Index Funds generated negative returns in the year 2008 due to financial crisis during that period.

A comparison of returns of both the Index Funds and ETFs reveals that the ETFs are performing better than the Index Funds. The average returns of all selected ETFs during the last five years is, by and large, 30.46 percent whereas the average returns of all Index Funds is, by and large, 26.53 percent. Junior BeES (ETF) on an average generated the highest return during the last five years among the ETFs and Index Funds and Bank BeES generated the highest return among all the schemes of ETFs and Index Funds during the year 2010 (Table-2 & Table -3).

6.2 Risk Analysis of ETFs and Index Funds

The risk is analyzed with the help of Standard Deviation, Beta and R-squared. Standard Deviation is a measure of the deviation of returns of the portfolio. A volatile stock would have a high standard deviation. It indicates how much the return on a fund is deviating from the expected returns based on its historical performance. Table- 4 and Table- 5 give the details relating to Standard Deviation, Sharpe Ratio, Beta, R-squared value and Jensen Alpha for ETFs and Index Funds respectively.

Table-4: Risk Analysis of Exchange Traded Funds

SL No.	Name of the Fund	Standard Deviation (%)	Sharpe Ratio	Beta	R-squared	Alpha (%)
1.	Bank BeES	49.27	.4847	.95	.99	2.3
2.	Junior BeES	69.43	.4061	1.38	.94	1.6
3.	S&P CNX Nifty BeES	48.66	.4153	.99	1	1.04
4.	Nifty BeES	48.74	.4082	.99	1	0.7
5.	ICICI SENSEX Pru. ETF	49.06	.4096	.98	.99	0.62

Source: The performance evaluation tools in the above table are calculated taking the annual returns of 5 years (2006-2010)

Table-5: Risk Analysis of Index Funds

Sl. No.	Name of the Fund	Standard Deviation (%)	Sharpe Ratio	Beta	R-squared	Alpha (%)
1.	HDFC Index Fund-Sensex Plus Plan	48.63	.3503	.97	.98	-2.25
2.	ICICI Pru. Index Fund	48.72	.4199	.99	1	1.27
3.	Franklin India Index Fund-NSE Nifty Plan	48.92	.3899	1	1	-0.18
4.	UTI Nifty Fund- Growth	48.49	.3871	.98	1	-0.31
5.	Franklin India Index Fund- BSE Sensex	49.23	.3918	.98	.99	-0.24

Source: The performance evaluation tools in the above table are calculated taking the annual returns of 5 years (2006-2010)

Standard Deviation

It is found that among ETFs, Junior BeES has the highest risk i.e., 69.43 percent and S&P CNX Nifty BeES has the lowest risk i.e., 48.66 percent. In the case of Index Funds, Franklin India Index Fund- BSE Sensex has the highest risk i.e., 49.23 percent and UTI Nifty Fund-Growth has the lowest risk i.e., 48.49 percent. The standard deviations of the ETFs are higher than the Index Funds. It means that the deviation of expected return is more in ETFs than Index Funds. ETFs are riskier compared to Index Funds; as a result, its returns are higher as compared to Index Funds as seen earlier.

Sharpe Ratio

It shows the return to variability. Higher the ratio, better is the performance, in terms of the return for the risk taken. It is found that all ETFs and Index Funds are showing a positive Sharpe Ratio. When compared to Index Funds, ETFs have the higher average ratio i.e., 0.42 percent approximately than Index Funds' average ratio i.e., 0.39 percent. According to Sharpe Ratio, ETFs are giving better performance of extra risk taken by investors.

Alpha

Alpha measures the excess returns over market return of the scheme. Here, all the ETFs having positive returns, which means that all the schemes are generating the excess returns than market returns. In case of Index Funds, only ICICI Pru. Index Fund has positive return and rest of the funds have negative return i.e., these schemes are generating lower returns than market returns.

R- Square

All the ETFs have the R-Squared values ranging from 0.99 to 1.00 except Junior BeES having slight deviation i.e. 0.94 which means that all the ETFs have exact correlation with the underlying Index and are moving in the same direction as that of the market returns except Junior BeES. In case of Index Funds, all the Index Funds have the R-Squared values ranging from 0.98 to 1.00. It means that, they have exact correlation with the underlying Index and are moving in the same direction as that of the market returns.

Beta Value

Beta measures the systematic risk and explains the nature of the volatility of the security return with that of the market return. If beta values are less than one, it means that the Fund's risk is less than the market risk; if it is one, it means the Fund's risk is the same as that of the market risk and if the beta is more than one, the risk of the Funds is greater than that of the market. All the ETFs have the beta values on an average approximately equal to 0.97 except Junior BeES having beta value 1.38, implying lower volatility in the returns of the ETFs than the underlying index volatility except for Junior BeES. In case of Index funds, all the funds have the beta values on an average approximately equal to 0.98, implying lower volatility in returns of the Index funds than the underlying index volatility. The risk of Junior BeES is greater than that of the market among all ETFs and Index Funds.

6.3 Tracking Error of ETFs and Index Funds

Tracking error is defined as the annualized standard deviation of the difference in returns between the index based funds and its index. It is a very important metric for index tracker. In simple terms, it is the difference between returns from the index based funds to that of the index. It indicates how close the weightages of the stocks in the portfolio are to the weightages of the stocks in the index. Closer the weightage of the stocks in the portfolio to the index, lower will be the tracking error. Tables- 6 and 7 show the tracking error of various selected schemes:-

Table- 6: Tracking Error of ETFs as on December'2010

S. No	Name of the Fund	(%)
1.	Bank BeES	0.24
2.	Junior BeES	0.52
3.	S&P CNX Nifty BeES	0.80
4.	Nifty BeES	0.14
5.	ICICI SENSEX Pru. ETF	1.82

Source: Fact Sheets of Selected Mutual Funds

Table- 7: Tracking Error of Index Funds as on December'2010

Sl. No	Name of the Fund	(%)
1.	HDFC Index Fund-Sensex Plus Plan	2.53
2.	ICICI Pru. Index Fund	2.28
3.	Franklin India Index Fund-NSE Nifty Plan	1.75
4.	UTI Nifty Fund- Growth	2.03
5.	Franklin India Index Fund- BSE Sensex	1.84

Source: Fact Sheets of Selected Mutual Funds

It is found that the tracking error is very high in HDFC Index Fund-Sensex Plus Plan i.e., 2.53% and is low in Franklin India Index Fund-NSE Nifty Plan i.e., 1.75%. In case of ETFs, tracking error is high in ICICI SENSEX Pru. ETF i.e., 1.82% and is very low in Nifty BeES i.e., 0.14% only. It shows that tracking error is very high in Index Funds compared to ETFs.

6.4 Expense Ratio of ETFs and Index Funds in India

An expense ratio tells how much a fund costs. The amount is skimmed from the investors' account and goes towards paying a fund's total annual expenses. It is expressed as a percentage of a Fund's Net Assets. If an investor invests in an ETF with an expenses ratio of 0.10 percent and has invested Rs.3000 in that Fund, the investor has to pay Rs.3 a year in expenses. Tables-8 and 9 give the details of expense ratio of the selected schemes of ETFs and Index Funds during the period 2006-2010.

Table-8: Expense Ratio of ETFs (in %)

Sl. No.	Name of Fund	2006	2007	2008	2009	2010	Average
1.	Bank BeES	0.45	0.48	0.50	0.50	0.50	0.48
2.	Junior BeES	1.00	1.00	1.00	1.00	1.00	1.00
3.	S&P CNX Nifty BeES	0.50	0.50	0.50	0.50	0.50	0.50
4.	Nifty BeES	0.45	0.48	0.50	0.50	0.50	0.49
5.	ICICI SENSEX Pru. ETF	0.86	0.80	0.80	0.80	0.80	0.80

Source: AMFI

Table- 9: Expense Ratio of Index Funds (in %)

Sl. No.	Name of Fund	2006	2007	2008	2009	2010	Average
1.	HDFC Index Fund-Sensex Plus Plan	1.50	1.50	1.50	1.50	1.00	1.40
2.	ICICI Pru. Index Fund	1.25	1.25	1.25	1.25	1.50	1.30
3.	Franklin India Index Fund-NSE Nifty Plan	1.00	1.00	1.00	1.00	1.00	1.00
4.	UTI Nifty Fund- Growth	0.62	0.75	1.21	1.50	1.50	1.12
5.	Franklin India Index Fund- BSE Sensex	1.00	1.00	1.00	0.96	1.00	.99

Source: AMFI

In case of ETFs, it is found that the Nifty Junior BeES has the highest expense ratio i.e., 1.00 percent on an average during the years and Bank BeES has the lowest ratio i.e., 0.48 percent during the years. The average expense ratio of ETFs is approximately 0.65 percent.

In case of Index fund, it is found that HDFC Index Fund-Sensex Plus Plan has the highest expense ratio i.e., 1.40 percent on an average during the years and Franklin India Index Fund-BSE Sensex has the lowest expense ratio i.e., 0.99 percent on an average during the years. The average expense ratio of Index funds is approximately 1.16 percent.

ETFs have the lower expense ratio as compared to the Index Funds.

7. Findings of the Study

ETFs have given better opportunity to the small investors in terms of diversified portfolio with a small amount of money. ETFs investment has given better performance over Index Funds. Expense Ratios of ETFs are much less compared to the Index Funds. Therefore, investing in ETFs is less costly; Bank BeES, S&P CNX Nifty BeES and Nifty BeES have achieved 0.50 percent of expense ratio each in 2010. More than 1 percent of expenses can be saved in ETFs compared to Index Funds. Here, though the underlying asset is same, tracking error is less in ETFs; thus, automatically ETFs give better returns than Index Funds. ETFs are better than Index Funds in terms of Risk and Volatility. According to Sharpe Ratio, ETFs give better performance for extra risk taken by the investors. All the ETFs and Index Funds have the R-Squared values approximately ranging from 0.97 to 1.00 except Junior BeES (0.94). It means that they have exact correlation with the underlying Index and are moving in the same direction as that of the market returns except Junior BeES.

8. Conclusion

In the last fifteen years, since 1993 the popularity of ETFs has increased manifold. This has attracted a lot of attention from both the investors and the market participants, resulting in the introduction of a variety of ETFs and continuous innovations in the ETF industry. As the variety of financial indices has increased, there has been a corresponding increase in the spectrum of ETF varieties available in the market.

ETFs have technical advantages over Mutual Funds and have shown the ability to capture investors' money. The advantages are low cost, less tracking error and more liquidity. They are a good investment suitable for individual investors and professionals.

However, now the Indian economic conditions are gradually stabilizing and equity markets are performing well because of political stability and positive signs about the economy. Investors always look for better returns and it is the equity markets which can give better returns and therefore, there is a huge potentiality for the introduction of more equity ETF products in India. However, the ETFs can become the best investment alternative, provided awareness is created among the investors.

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Status of Gender Equality: A Survey among Select Corporate Bodies in Kolkata

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Abstract: This paper is based on an original study carried out to assess the status of gender equality in some select corporate houses in Kolkata. Specific issues targeted in this study are the gender composition of the workforce at the managerial and grass root level, basis of promotion, personal amenities provided to employees, gender based reservation, the employees' role perceptions and domestic responsibilities. The responses obtained from the employers and the employees throw adequate light to analyze the causes of gender inequality at the workplace.

Key-words: Equality, promotion, reservation, gender-bias, role perception.

1. Introduction

The status of women in our society is, in general, one of subservience to men. It gets reflected in different ways, some of which often go unnoticed or uncalled for. Men fare better than women in respect of most socio-economic indicators which are often caused by deliberate action of various agents enjoying authority in our society. It is well recognized that gender discrimination exists 'in every region, at all economic developmental levels, in all political systems, and in diverse religious, social and cultural environments' (*Anker, 1998*).

This paper examines the state of male domination in some of the corporate houses in Kolkata. The findings are based on an empirical survey conducted in 50 corporate houses. The specific issues targeted during the survey are the personal perceptions, corporate policies relating to promotion, pay fixation, gender-based reservation, provision for fulfilment of personal life obligations and the gender-divide at the workplace. It seeks to provide a background for analysing the causes of gender inequality at workplace.

2. Survey of Literature

The afflicted world in which we live is characterized by deeply unequal sharing of the burden of the adversities between women and men. Indeed, gender inequality is not one homogeneous phenomenon, but a collection of disparate and interlinked problems. The identified inequalities are expressed through differences in mortality rate, basic facilities and special opportunities in all spheres of life – in professional work, in nature of ownership of assets and in the household chores. The socio-cultural structure starts the process of gender discrimination even before the birth of a child (female foeticide) and the process is carried on in every stage of life - be it basic education, working at home, child rearing strategies, seeking higher education, seeking economic independence or applying for jobs.

To avoid this bias, care must be taken to ensure equal opportunity to both genders in every sphere of life. Equal opportunity calls for improving the chances for effective choice and action by optimizing the match between individual capacity and social opportunity; and elimination of the obstacles and construction of opportunity that encourages more frequent expression of self determination. Some class of individuals lack the capacity or opportunity of self determination and all institutions in the society should optimize the prospects among these least advantaged members by increasing their capacity and improving their opportunity to self determine (*Mithang, 1996*).

'Humans' as 'social animals' are expected to behave consistently in accordance with their societal gender roles. Each gender has some definite rights and duties, restrictions and obligations towards the society and they have to maintain it by behaving in a proper manner. The societal code of conduct varies from one time to another and from one place to another but is usually followed by the contemporary people of both genders.

The breaking up of the 'breadwinner-homemaker' model and the joint family system has encouraged the women to come out of their homes and seek work opportunities in the formal employment sector. The position of educated women seems to swing much between the two roles as they are neither entirely confined to their homes nor given full freedom to fulfil their aspirations. Working in the same routine like a man does not absolve them from their socially imposed domestic responsibility and they are forced to combine work with family obligations (*Perun and Biebly, 1981*). These double roles produce tension and conflict on account of the desire to carry out the dual responsibilities efficiently (*Kapur, 1974*).

These dual responsibilities are further exemplified when *Neerja and Sharma (1988)* state that the mother is the most important variable in child development and she offers a range of socio-emotional and cognitive experience to her child. Due to household and reproductive obligations, many women have interruptions in their employment or have to accept a part time job (*Moen, 1985*). The confinement for child rearing is a major obstruction to woman's participation in labour force (*Moore and Hofferth, 1985*). As a result, women prefer to be employed in occupations that are low paid, require fewer skills and have little scope for improvement (*Banerjee, 1991*).

In the environment of adversities and social obligations that are faced by women, women's empowerment and independence can be measured by the following seven indicators as suggested by *Sharma* (2004). These indicators are: Mobility; Economic security; Ability to make purchase of higher values; Involvement in major household decisions; Relative freedom from domination within the family; Political and legal awareness and Involvement in political campaigning and protest.

Male behaviour patterns are more valued than feminine characteristics at workplace creating a potential barrier to the females. Workplace behaviours rated high in the masculine values favour the male paradigm, requiring such qualities as risk taking, aggressiveness and task orientation (*Fagenson, 1990*). This view is supported by *Case* (1994) who states that women socialize into roles that involve nurturing and sharing, and men socialize into roles that involve competition and individualism.

The concept of leadership remains a masculine notion defined by subtle and deeply rooted cultural norms and values in the organization. The result is that the women are rated as having the required skill but are not seen culturally as leaders in comparison to men (*Merill Sands and Kolb, 2001*). There is usually a gender difference in management styles, with men's style identified as more initiating and women's as more considerate and co-operative (*Davidson and Cooper, 1992*).

Explanations for lesser number of women in leadership positions include the prescriptive nature of stereotypes, many women's lack of ambition or fear of assault on their 'authenticity' (*Saunders, 1996*). *Still* (2006) further adds that women prefer to support rather than be in line management because of the nature of the work, lack mentors and networks at workplace and finds it difficult to adjust and operate within certain organizational cultures.

The concept of 'entrepreneurship' also advocates masculine characters as observed by *Bruni, Gherardi and Poggio* (2005). According to them, women frequently lack specific technical skills that tend to dissociate them from starting business in the manufacturing and high tech sectors, and also reduce their likelihood of survival in these sectors. Women encounter greater difficulties in obtaining financial resources and these indulge them to choose low capital intensive activities like those in service sector.

There are many grounds on which an employee is discriminated from others. Among those usually employed at workplace, the more significant grounds are pay package, promotion, performance appraisal, opportunity for training, overseas assignment, fringe benefits and perquisites, punishment and dismissal, special provision, provision for transportation, work environment, and above all, the interpersonal relationship with superiors and co-workers.

3. Methodology

For the purpose of the study, the employment sector is divided into two halves namely Public Sector and Private Sector. A total of 50 corporate houses were selected which included 16 companies from the public sector and 34 from the private sector. For the convenience of the study and for inclusion of different types of employers (employment), the sectors were further classified into Information Technology, Consumer Products, Manufacturing House (Factory), Bank, Telecommunication, Education, Finance, Healthcare Services, Hotel and Other Allied Services. Five institutions from each sector were selected on the basis of their size (market capitalization) and availability (location of office in or around Kolkata with HR Department and willingness to give information or time) and were interviewed with the help of questionnaire. Each subdivision had companies from the private sector as well as those from the public sector.

The study contains 50 responses from the HR Managers / Personnel Officers relating to corporate policies and 500 responses from employees (250 males and 250 females) randomly selected from these companies using non-probabilistic (judgemental) sampling technique. The survey was conducted from January 2009 to May 2010. For analysis, these data have been grouped together for brevity, analysis and presentation.

4. Responses from HR Managers

From the responses obtained from the employers (HR Managers) [Ref. Annexure Tables] the following information emerge:

a. Board of directors: Out of 36 institutions providing information regarding their governing bodies, it is observed that 9 institutions did not have any female member in their governing body. It is further noted that in the remaining 27, there is not even 50% representation of females in the decision making bodies. Moreover some of the women have made it to the management by virtue of their birth or marital status.

b. Managerial position: Out of 50 institutions surveyed, only one private school have more females at managerial position with 5 institutions having no female manager and another 6 having less than 10% female managers. It is seen that in only 13 institutions females account for more than 50% of male representatives as managers.

c. Employees: In every institution surveyed, males out-number females except in 2 private schools and in 1 private sector hospital. The worst male-female ratio is found in the factories. In contrast, the IT sector, schools and hospitals present a picture more favourable to females.

d. Promotion: Periodic performance appraisal and seniority are considered to be important ingredients for promotion. The HR managers along with the performance report from the present job are also considered vital in promoting an employee.

e. Reservation: Special gender based reservations are absent barring in 4 institutions (3 hospitals and 1 FMCG company) but on enquiry it is found that if given a choice 34 (out of 50) HR managers would like to select a candidate according to the nature of the job.

f. Personal amenities: It is interesting to note that provision for baby-care facility (crèche) at the workplace is available in only one out of the 50 institutions surveyed. Excepting in 6 institutions, provisions for flexible working hours and change of shift are usually not given to employees which makes it difficult for females. To compound this problem, only 11 institutions had provisions for pick up or drop facilities in case of overtime or late night shift.

5. Responses from employees

a. House-hold responsibilities: Household chores like cooking and washing clothes are primarily considered to be a female affair and such jobs are carried on by females in 92% of the families surveyed. 61% of the respondents further believed that it is the responsibility of the mother to look after the young child till he/she is 5 years of age.

b. Cause of resignation: 64% of the males resigned to look for a better job opportunity for a better career and 15% were seeking for a job with more security. In contrast, domestic responsibility was said to be the primary cause of resignation of females (49%) followed by workplace harassment (12%).

c. Personal perception: 58% of the females agree that their self esteem increases if their spouses are in a better position than them at workplace but 81% of the males feel otherwise in this matter. 51% of the females disagree on the issue of accompaniment by their spouses in case of transfer whereas 42% are undecided on this issue.

d. When the respondents were asked to associate gender with jobs, nursing and primary teaching was said to be a female job by 84% and 71% respectively whereas bus driver, pilot and CEO were deemed to be a male job by 97%, 90% and 60% respondents respectively.

6. Summary and Conclusion

It is observed that the formal employment sector is primarily male dominated, controlled and managed. Decision making role is denied to women in all organizations surveyed. In some institutions where women are present in the governing body or in managerial positions, they are in minority.

Promotion or appointment decisions are usually taken by HR managers or personnel department which again shows male control. Although gender based reservations are absent (barring in 4 institutions), from the employee responses it is observed that jobs are gendered by our socio-cultural norms and HR managers, on most occasions if given a choice, would like to select a candidate on the nature of the job.

It has to be accepted that working women from nuclear families have to accept their dual responsibility and fulfil their family obligations which restrict them in their personal lives on the one hand and on the other, lack of crèches, flexible working hours, provision for day shift in emergencies, personal bias in promotion, transfer, etc. hamper their working life to a great extent.

The result is a paradox: Women are provided with all opportunities including legal provisions theoretically but in practical situation as observed, women are out-numbered and have to survive a tough situation in the corporate hierarchy.

7. Limitations of the study

- Due to time and resource constraints, the study has considered 50 corporate houses and 500 employees as sample which is few in number compared to the total population.
- The presumption that every HR manager and employee has perfect knowledge about all the questions asked during the survey is not always true.
- The study is conducted in well organized formal employment sector. The large unorganized informal sector might present a different picture.

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Annexure

Table showing Male-Female bifurcation of the number of Directors, Managers and Employees and those who have retired or resigned in the last 2 years (Public sector- *, Private sector- #)

ALLIED SERVICE PROVIDER

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A*	25	3	280	85	30	15	15	9	NA	NA
B*	5	0	3035	38	201	1	NA	NA	NA	NA
C#	3	2	105	25	8	2	NA	NA	10	2
D#	6	0	360	90	60	40	NA	NA	NA	NA
E#	19	1	1887	148	109	2	41	2	198	27

BANK

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A*	NA	NA	107	13	15	2	15	3	NA	NA
B*	NA	NA	83	27	18	10	NA	NA	NA	NA
C#	6	0	120	35	20	8	10	7	NA	NA
D#	NA	NA	62	13	41	2	NA	NA	NA	NA
E#	NA	NA	70	30	3	0	41	2	NA	NA

COMMUNICATION

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A*	NA	NA	180	76	12	4	NA	NA	NA	NA
B#	NA	NA	85	38	10	9	NA	NA	30	25
C#	NA	NA	80	30	1	1	NA	NA	NA	NA
D#	NA	NA	175	58	12	10	NA	NA	20	22
E#	NA	NA	146	65	10	3	NA	NA	NA	NA

CONSUMER PRODUCT

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A#	13	1	412	19	46	6	5	0	15	2
B#	5	2	86	23	5	1	4	1	NA	NA
C#	12	0	610	205	350	15	25	10	55	5
D#	3	1	107	25	12	3	NA	NA	20	5
E#	NA	NA	80	35	25	10	5	3	5	8

EDUCATION

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A*	12	0	21	3	2	0	2	0	NA	NA
B*	9	4	18	16	2	1	2	1	NA	NA
C*	13	0	25	6	2	0	2	0	1	0
D#	6	3	60	182	2	14	3	6	4	7
E#	9	0	59	64	6	0	2	1	1	6

FINANCE

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A*	10	0	42	18	15	5	8	5	NA	NA
B#	4	2	115	33	20	15	NA	NA	NA	NA
C#	NA	NA	130	59	30	12	NA	NA	3	1
D#	6	3	120	80	45	30	NA	NA	20	15
E#	4	1	250	10	24	2	NA	NA	NA	NA

HOSPITAL

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A*	NA	NA	250	150	70	20	80	39	3	0
B*	9	6	187	54	9	5	6	2	0	0
C#	2	1	150	230	45	20	2	5	40	52
D#	3	1	150	55	23	12	NA	NA	12	8
E#	4	2	180	79	18	12	18	10	15	18

HOTEL

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A#	8	3	200	58	25	15	NA	NA	20	10
B#	1	1	80	12	4	2	NA	NA	5	8
C#	3	2	80	21	8	3	NA	NA	0	0
D#	3	1	130	65	15	8	NA	NA	10	12
E#	2	1	55	12	5	2	NA	NA	4	1

INFORMATION TECHNOLOGY (IT)

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A*	7	4	285	150	56	36	38	15	20	10
B#	14	0	3000	1500	88	30	NA	NA	50	20
C#	8	1	120	35	9	4	6	8	3	5
D#	NA	NA	7000	1750	200	155	NA	NA	55	33
E#	5	3	2000	1500	200	180	NA	NA	80	25

MANUFACTURING

	Director		Employee		Manager		Retired		Resigned	
	M	F	M	F	M	F	M	F	M	F
A*	23	2	10260	427	20	1	440	106	NA	NA
B*	12	1	290	32	14	0	NA	NA	NA	NA
C*	10	5	250	85	30	10	80	25	NA	NA
D#	NA	NA	912	29	381	13	NA	NA	0	0
E#	5	2	205	90	50	25	38	20	5	3

Embedded Problems of Segment Reporting: An Overview

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Abstract: Various accounting standards have failed to resolve some practical problems associated with segment reporting even after four decades of its development. There is a gap between the expectation of stakeholders from the segment report and content of the same. This study highlights such practical problems of segment reporting and the silence of various accounting standards on these issues. The article provides some suggestions to improve the quality of the segment report, and also to resolve the different critical issues associated with it.

Key-words: Segment reporting, IFRS, segmental transfer pricing, segment disclosure, segment result, window dressing.

1. Introduction

In the present scenario when the world has become a global village, information technology has become complex, economic policies have been liberalized and business entities diversified, the consolidated financial statement alone fails to represent the overall view of financial information precisely and correctly. Due to the different growth rate, profitability and risk among the segments of a diversified company, stakeholders are not fully satisfied by the aggregated financial statement. They like to get certain separate segment information in the form of segment report besides the aggregated report. The presentation of segment information helps the stakeholders to identify and analyze the opportunities and risks which a diversified company faces.

Considering the needs of stakeholders, various accounting bodies, accounting committees, standard setting bodies have come out with some accounting standards to make the segment reporting more meaningful and relevant. These standards guide and direct as to how the reportable segment should be identified and what disclosures should be made to make up the segment report. The main aim of accounting standards is to harmonize the diverse accounting policies and practices which will assist the stakeholders in making efficient economic decisions. So, accounting standards reduce the possibility of varying assessment for the same operating result by providing accounting information on a more comparable and consistent basis. Actually the concept of segment reporting has come to the surface in twentieth century. In the mean time, various accounting standards on segment reporting were issued by various standard setting bodies both at national and international levels. In this backdrop, it is necessary to study the validity of accounting standards on segment reporting to resolve the practical problems associated with segment reporting (e.g. basis of transfer pricing and basis of distribution of joint items like assets, expenses etc.) in terms of comparability and consistency.

The objective of the present article is to reflect some practical problems in segment reporting and explore the attempts of some important accounting standards on these counts. The study is divided into six sections. Besides this introduction part, the second section explores the historical perspective of segment reporting and the section 3 of the study identifies some key practical problems of segment reporting. The fourth section highlights the failure of some important standard setting bodies to resolve such problems by formulating various accounting standards. The fifth section of the study offers some suggestions to resolve such problems and finally make a logistic conclusion.

2. Historical Perspective of Segment Reporting

The concept of segment reporting in a finalized form is almost 38 years old. It was in 1974 that the Financial Accounting Standard Board (FASB) of USA issued SFAS 14 Financial Reporting for segment of a business enterprise with strong encouragement from the financial analyst community. This is the beginning point of segment reporting. In June 1997, FASB issued SFAS 131 which is revised format of the SFAS 14. In 1981 international accounting standard setters, International Accounting Standard Committee (IASC) issued International Accounting Standard 14 (IAS 14) Reporting Financial Information by Segment. This was revised by IASC in 1997. In India, the Accounting Standard Board of the Institute of Chartered Accountants of India (ICAI) issued Accounting Standard 17 (AS 17): Segment Reporting. SFAS 131 is effective from the financial year beginning after December 15, 1997. Earlier application is encouraged. SFAS 131 need not be applied to interim financial statements. IAS 14 is effective from the period beginning on or after July 1, 1998. It does not require segment disclosure for interim report. AS 17 comes into effect from the accounting period commencing on or after 01-04-2001 and is mandatory in nature. In this regard, one thing can be noted that SFAS had made voluntary disclosure about segment reporting for interim periods for listed companies for the quarter ended 30-09-2001, but it had made it compulsory for all listed companies announcing their results for the quarter ended 31st December 2001. In the age of convergence IASB has issued a number of new International Financial Reporting Standards (IFRS) to replace some International Accounting Standards as part of its convergence project. In this project, IASB and FASB try to reduce difference between IFRS and US Generally Accepted Accounting Principle (US GAAP). As a result, IFRS 8 replaces IAS 14 and aligns segment reporting with the requirements of SFAS 131. Once IFRS 8 is effective, segment reporting under IFRS and US GAAP will be converged. Very recently ICAI has also issued converged Indian Accounting Standard Ind-AS 108 "Operating Segments" for segment reporting.

3. Some Practical Problems of Segmental Reporting

The main objective of segment reporting is to provide segment wise financial information like segment revenue, segment expenses, segment result, segment assets, segment liabilities etc. to stakeholders to enable them to take more informed judgment about any segment of the reporting entity or about the reporting enterprise as a whole. Some problems in the reporting of income for different segments of an enterprise, of course, are related to the allocation of joint costs and the treatment of inter segmental transfer pricing. To measure profitability of segments separately, it is necessary that their net assets are reported segment wise. There are also some difficulties in the measurement of assets segment wise. The important problems are discussed below:

(a) Arbitrary allocation of joint cost

Even though it is not difficult to identify the significant reportable segments of an entity by business line or economic environment, it is difficult to report segment wise cost as most of the costs incurred by the enterprise are joint costs in nature. Reliability of the segment profit or loss largely depends on the appropriateness of the basis of joint cost allocation. This joint cost may allocate on several reasonable basis which leads to diversity and inconsistency in reporting practices. In absence of any standardized method for joint cost allocation, it is possible to opt for suitable cost allocation method to arrive at the desired segment result. So there is a chance for window dressing that means users are not getting the reliable information of the various segments from the financial statement.

(b) Interchangeable assets

Generally certain assets are utilized for more than one segment. In such case, it is very difficult to earmark assets employed for a particular segment. As a result, profitability of a separate segment cannot be accurately measured. Moreover, the proportion of unidentifiable assets may be significant and therefore no relevant result of return on segmental assets can be computed for evaluating comparative performance of various segments.

(c) Influence of transfer pricing

Transfer price is the price at which one segment transfers its product or services to another segment within a particular enterprise. There are various methods of transfer pricing like cost plus method, negotiated transfer pricing method, market price method etc. That means the transfer price is varied on the basis of the method which is applied. Hence the segment results may be influenced by the transfer pricing formula. The profit of an efficient segment can be distributed among interconnected segments which is not reliable at all. In this ground it is notable that the Bear Steams equity research has supported the segmental manager's misinterpretation about their own segment performance by using transfer pricing mechanism because their incentive depends on their performance.

Now it is desirable that the accounting standard should chalk out a standardized method to resolve such problems as the main objective of accounting standards is to standardize the diverse accounting policies and practices with a view to enhance the comparability and consistency of financial statements. So the next part will explore the various remarkable accounting standards on segment reporting to highlight how they addressed such problems.

4. Some Important Accounting Standards on Segment Reporting

Keeping in view the needs of the users of accounting information, major accounting bodies like the Financial Accounting Standard Board, International Accounting Standard Board and the Institute of Chartered Accountants of India have come out with the revised and modified standard in order to make segment information disclosure more meaningful and relevant. It is also very much clear from the history of segment reporting that there are several accounting standards. But some of the important standards have been analyzed only to explore the attempts which have been made to resolve such practical problems by various standard setters' bodies at both national and international levels. The standards are explained one after another.

AS-17

The Accounting Standard Board of ICAI has issued AS 17 for segment reporting. This standard comes into effect in respect of accounting period which commences on or after April 1, 2001 and it is mandatory in nature. It defines *Segment Revenue* which is the aggregate of:

i) revenue resulting from the operating activities of a segment,

ii) relevant portion of enterprise revenue that can be allocated on a reasonable basis to the segment, and

iii) revenue from transactions with other segment of the same enterprise.

It also defines *Segment Expenses* which is the aggregate of:

i) expenses resulting from the operating activities of a segment,

ii) relevant portion of enterprise expenses that can be allocated on a reasonable basis to the segment, and

iii) expenses relating to transactions with other segment of the same enterprise.

However, expenses incurred at the enterprise level on behalf of a segment should be included in the segment expenses, if such expenses relate to the operating activities of the segment. *Segment Result* refers to the difference between segment revenues and segment expenses.

Segment Assets are those operating assets which are used by the segment in its operating activities and those are directly attributable to the segment or allocated to the segment on a reasonable basis.

Although the standard defines the terms segment revenue, segment expenses, and segment assets it does not clear what will be 'the reasonable basis.' So it allows the accountant's choice to measure such items which leads to divergent reporting practices.

For the purpose of this standard, segments are classified as primary and secondary on the basis of dominant source and nature of risk and return of the enterprise. The extent of disclosure is lower for secondary segment than that for the primary segment. Apart from other disclosures, it also asks to disclose the following items:

i) For reportable primary segment

- Segment revenue with a break-up of sales to external customers and from transaction with other segment.
- Total carrying amount of segment assets.
- Inter segment transfer should be measured on the same basis that the enterprise actually used to price those transfers. The basis of inter segment transfer pricing and change therein should be disclosed in the financial statements.

ii) For reportable secondary segment

- Segment revenue from external customers.
- Total carrying amount of segment assets.
- Total cost incurred during the period to acquire segment assets (both tangible and intangible).

Although it is required to disclose such items for both the reportable segments, it should not be useful to the stakeholders as they are not measured accurately. It claims to measure the inter segment transfer on the basis that enterprise actually used to transfer but is silent about any specific method of transfer pricing. So the segment report may mislead the financial statement users.

IAS 14

The international standard on the segment reporting IAS 14 has been published by the IASC in August 1981. Subsequently this standard was revised and has come into effect on 1st July 1998. It provides new approaches to determine reportable segment. These approaches are:

1) Risk-Return Approach

   In this approach, the segments are defined on the basis of dominant source of risks faced by and the return flowing to the enterprise.

2) Management Approach

   Under this approach, segments are defined on the basis of the enterprise's organizational structure and internal financial reporting system.

As per IAS 14 geographical segment to be based on either:

a. Location of its production or services facilities and other assets, or,
b. The destination of its goods or services that means location of its customers and markets.

The IAS 14 asks to disclose the following items in addition to other disclosures:

A. The primary segments:

- Sales or other operating revenues
- Sales to external customers
- Revenues from transaction with other segments
- Depreciation and amortization expenses
- Segment results
- Segment assets
- Basis of pricing of inter-segmental transfers

B. The secondary segments:

- Sales to the external customers
- Segment assets
- Basis of inter segment transfer pricing

This standard more clearly explains the basis of the determination of reportable segment but it also allows the same technique to measure such problematic items. So it is also not free from bias.

SFAS-131

FASB issued the new SFAS 131, 'Disclosures about Segment of an Enterprise and Related Information' in the place of old accounting standard on segment reporting SFAS-14. This standard is effective for the financial statement for periods beginning on or after December 15, 1997. SFAS 131 changes the framework for reporting operating segments information and identification process of operating segments to a system based on company's management approach. Operating segment is a component of an enterprise which the management has established for the purpose of decision making about the enterprise's operating matters. The enterprise may combine two or more segments:

1) if they have similar long-term financial performance and same features in product or services, production process, technology, type or class of customers, distribution method of product or services,

2) if they operate under the same regulatory environment.

Besides other disclosures, it asks to disclose the following items:

A. General information
  - Factors used to identify reportable segments
  - Types of products or services that reportable segments provide

B. Information about profit or loss and assets
  - Revenue from external customers
  - Revenue from inter segment transaction
  - Depreciation, depletion and amortization expenses

C. Basis of measurement
  - Basis of accounting for inter segment transaction
  - The nature and effect of asymmetrical allocation to segments

This standard claims to disclose the basis of the determination of reportable segments and the method of transfer pricing but it is silent about any specific method of transfer pricing or any specific method of distribution of the joint costs or assets among the reportable segments. So it should be able to reflect the effects of transfer pricing mechanism to some extent but totally fails to ascertain the segment asset, expenses and revenue accurately.

IFRS 8

IFRS 8 "operating segment" applies only to listed company. It replaces IAS 14 and is effective from periods beginning on or after 1st January 2009. Operating segments are identified on the basis of internal reports. Internal report is a report which is used by the entity's chief operating decision maker to allocate resources to the segment and assess its performance. This is because IFRS 8 requires the information which is used by the management to make decision about operating matters. The IASB believes that this management approach will help to improve financial reporting by allowing users of financial statement to review the operation through the eye of management. There is little cost of preparers as the information is already used internally by management and the information is available on a timely basis.

Core Principle

An entity should disclose information to enable the users of financial statements to evaluate the nature and financial effects of the different types of operation in which it engages and the surrounding economic environment. This principle is consistent with the objective of financial reporting discussed in the IASB's Framework for the preparation and presentation of financial statements. It defines *operating segment* as a component of an entity that engages in business activities from which it may earn revenues and incur expenses; whose operating results are reviewed regularly by the entity's chief operating decision maker to make decision about its resource to be allocated to the segment and assess its performance and for which discrete financial information is available. According to this standard, an entity should disclose information about its operating segments to enable users of financial report to evaluate the nature and financial effects of the business activities and the economic environment in which it operates. Like SFAS – 131, it also asks to present the disclosures on general information, information on profit or loss and assets and basis of measurement apart from the other disclosures to be made by the entity. For better reporting purpose, these disclosures are also required to be made under IFRS – 8 where the entity is to disclose some additional information about profit or loss and assets, basis of measurement. It is very interesting to mention below the disclosure requirements under IFRS – 8 to make a comparison with the requirements of disclosure to be made under SFAS – 131. It appears to be very similar though some additional information are required in the case of IFRS – 8. It asks to disclose the following items:

A. General information
  - Factor used to identify reportable segments.
  - Types of products and services that reportable segment provides.

B. Information about profit or loss and assets
  - Revenue from external customers.
  - Revenue from inter segment transfer.
  - Depreciation, depletion and amortization expenses.
  - Income tax expenses and benefit.
  - Material items of income and expenses.

C. Basis of measurement
  - The amount of each item shall be measured on the same basis which is used for reporting to the chief operating decision maker.
  - Adjustment, elimination and allocation shall be made if they are included in the chief operating decision maker report.
  - Assets also are reported on the same basis which is followed to prepare the chief operating decision maker report.
  - If the chief operating decision maker uses more than one method to determine the segment profit or loss and assets, then reported method should be the one consistent with the corresponding amounts in the entity's financial statements.

However, entity shall also disclose the following general measurement basis:

- Basis of accounting for inter segment transaction.
- Nature of difference between the measurement of profit or loss of reportable segments and enterprise as a whole.
- The nature of any difference between the measurement of segment assets and consolidated assets.

This standard claims to use the same method of transfer pricing and same method for allocation of joint assets or expenses which are followed to prepare the chief operating decision makers' report. Therefore, it gives weight to managements' discretion, but not to any specific method. It also requires disclosure of the basis of determination of reportable segments and the method of transfer pricing, but it is silent about any specific method of transfer pricing or any specific method of distribution of the joint costs or assets among the reportable segments. It is able to capture the effects of transfer pricing mechanism to some extent, but totally fails to ascertain the segment asset, expenses and revenue uniquely. So it may lead to non-comparable and in-consistent report as sometimes decision makers change their pattern of analysis.

5. Conclusions and Suggestions

In the age of convergence, almost all accounting standard setting bodies are trying to develop a single set of accounting standards for improving the quality of financial statement, but they forget about the basic objective which is to recognize the system of measurement and disclosure rules for preparation and presentation of financial statements. Another main objective of the accounting standard is to standardize the divergent accounting policies and practices. But the available accounting standards on segment reporting do not pave the way for allocation of common cost or assets and are also silent about any specific method of transfer pricing. Almost all the accounting standards are only concerned with the identification of reportable segment and the items to be disclosed. Some international standards claim to disclose the method of transfer pricing and suggest using the same basis of distribution of joint cost and assets which is used by internal decision makers. Very recently, developed international accounting standards IFRSs are 'principle-based' standards, rather than 'rule-based' standards which rely more on professional judgment. It allows management wide latitude in the choice of accounting; management faces discretionary accounting decisions which are heavily oriented to a judgment process of determining amounts, rates and timing. This situation enables management to influence the figures disclosed. Discretion in particular is recognized in the translation of the management accounts (internal report) to the financial accounts (annual reports). It is unfortunate to note that even after four decades of development of segment reporting, accounting standards have failed to standardize the various accounting policies and practices. It is important to note in this context that it fails to maintain two basic qualitative characteristics, comparability and consistency of financial statements. From the analysis it is very much clear that there is a gap between the expectation of stakeholders from the segment report and content of the segment report which is not desirable to us. So to minimize the gap as well as to improve the quality of the segment reporting some suggestions are put forward.

- The segmental reporting system should be supported by guidelines for allocation of joint costs to reporting segments and transfer pricing policy.
- To allocate the joint cost among the various reportable segments, activity based costing system may be used such that a cause-effect relationship can be maintained between activity consumption and cost incurrence. It will be helpful to both internal management as well as external stakeholders in taking better economic decisions.
- Entities should also have to disclose the basis upon which they distribute their total assets among various reported segments.

- A contribution format can be used instead of only disclosing the basis of common cost distribution because it separates fixed costs from variable costs and it enables the calculation of a contribution margin. In this case, traceable fixed costs should be separated from common fixed costs to enable the calculation of a segment margin.
- It will be preferable to disclose the common assets separately in the balance sheet of the entity and it may be disclosed in footnote that these assets are used commonly by several segments.
- It is not practicable to suggest any specific transfer pricing mechanism as it may be used as a tool to maximize the value of the enterprise as a whole. So it can be suggested that the manager should select the best method of transfer pricing not to maximize the value of his segment, rather to maximize value of the enterprise as a whole. The basis of transfer pricing should be used consistently such that financial statement is consistent enough. The basis of transfer pricing and if any change therein should be disclosed properly.
- Accounting standard setting bodies must address and resolve problems properly, so that segment reporting is made more reliable and relevant to the stakeholders for making more informed judgment in their economic decisions.

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Carbon Credit and Carbon Trading in India: An Overview

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Abstract : This paper modestly tries to explore an overview of carbon credit and carbon trading in India. The advent of the Kyoto Protocol (KP) on February 16th, 2005 has instigated a worldwide awareness to reduce Green House Gas (GHG) emissions. Since then, almost all the industrially developed and developing countries throughout the world have started considering this issue seriously and engaged themselves in formulating carbon emission standards and guidelines for controlling such harmful gas emissions. Being a developing one, India was not an exception to it and hence joined the race. Accordingly, the concepts of carbon credit and carbon trading have emerged from their efforts and been accepted worldwide as a sustainable solution to the problem concerned within a very short time span since its emergence. Therefore this paper aims at sketching the present scenario of carbon credit and carbon trading in India and identifying the future prospects of the same in India.

Key-words: Kyoto protocol, green house gases, clean development mechanism, emission reductions, carbon credit, carbon trading.

1. Introduction

Rapid industrialization is the outcome of modern civilization. Industrialization is undoubtedly necessary for the socio-economic development of a country but it should not be done at the cost of the environment. Fortunately, the profit seekers now have understood the true essence of environment within which they work, compete and keep their existence going. Therefore it is their duty to save the planet and maintain industrialization to an optimum level to keep the environment green and safe to avoid their extinction. There is no denying the fact that industrialization adds value to the society at large but simultaneously it is also true that its rapidity in recent times in search of higher growth and irresistible profit has caused frequent environmental hazards and has resulted into global warming, thereby possessing a serious threat to the environment. So appropriate measures have become necessary to control the ill-effects of industrialization and the Kyoto Protocol (KP) is perhaps the right step in this regard. It was initially adopted on 11th December, 1997 in Kyoto, Japan and had come into force on 16th February, 2005. It is mainly a protocol to the United Nations Framework Convention on Climate Change (UNFCCC) to control global warming. It is an international accord for restricting Green House Gas (GHG) emissions between the member countries. GHGs are the main factors that result in global warming and massive changes in climatic situations, sea-water levels, bio-diversity etc. The KP prescribes measures to control the harmful effects to environment by limiting the following GHGs:

- *hydro-fluorocarbons* mainly arising from the filling of and leakage from refrigeration equipments;
- *carbon dioxide* causing about 50-60% of the global warming;
- *methane gas* mainly trapping heat in the atmosphere, and
- *sulphur-hexafluoride* being produced by the magnesium production industry, electrical and electronics manufacturers.

The above mentioned gases are the main factor that causes global warming and result in destruction of the environment. The KP restricts and controls emission of such GHGs by setting emission reduction targets for its member countries. Now in this context it becomes imperative to discuss a few words about the member countries of the KP. At present there are 192 member countries in this protocol. The member countries are divided into three categories based on the volume of carbon emission viz. Annex I countries, Annex II countries, and Non-Annex I countries. Annex I group includes the industrialized countries who were previously the members of the OECD (Organization for Economic Co-operation and Development) in 1992, and countries with Economies in Transition (EIT). Annex I countries are Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, and United States of America. Annex II group is a further specification of the first group and consists of the OECD members of Annex I only and not the EIT countries. They are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States of America. This group is formed with an objective to provide financial assistances to the developing countries to help them to undertake emissions reduction activities under the Convention. The Non-Annex I group represents mostly the developing countries like India, China, Malaysia, Pakistan, Philippines etc. Countries belonging to this group do not require to reduce emissions unless developed countries supply funding and technology for such purpose. The year 1990 is considered as the base year by the member countries of the UNFCCC (*vide decision 2/CP.3*) and they are supposed to reduce their carbon emissions in comparison to 1990's emission level. Since the KP aims at establishing an international agreement between the member countries to handle issues like global warming and GHG emissions, the member countries are devoted towards an average diminution of 5.2% of GHG emissions from 1990 levels by the year 2012. According to the agreement, Annex I countries must have to fulfil their task to reduce GHG emission within 2008–2012 and developing countries like China, India and Brazil which belong to the Non-Annex group are safe as far as their GHG emission level is concerned. The KP advocates three flexibility mechanisms to help the member countries in meeting their emission reduction agreements (*Bashmakov et al.., 2001, p. 402*). The flexibility mechanisms consist of International Emissions Trading (IET), the Clean Development Mechanism (CDM), and Joint Implementation (JI) projects. The CDM and JI are together called as project-based mechanisms because they help in generating and trading emission reductions from different projects through IET. On the other hand, the IET is called an allowance based mechanism as it is based on the setting of a quantitative restriction of emissions. According to the protocol, each member country should prepare a yearly report containing information regarding its GHG emissions by a "Designated National Authority" (DNA). The three flexible mechanisms work together and help the member countries of KP to reduce GHG emissions in the following way:

- IET allows countries that have extra units of emission reductions by emitting below their maximum limits, to sell that excess capacity to the countries that cross their emission targets or limits. Emission reduction transacted through the IET is called Assigned Amount Units (AAU).
- JI allows developed countries with an emission reduction or limitation commitment under the Kyoto Protocol to earn Emission Reduction Units (ERUs) from an emission-reduction or emission removal project in another developed country. It offers developed countries a flexible and cost-efficient means of fulfilling their Kyoto commitments.
- Emission reductions produced by the CDM are called Certified Emission Reductions (CERs). The CDM allows emission-reduction projects in developing countries to earn Certified Emission Reduction (CER). These CERs can be traded and sold, and used by industrialized countries to a meet a part of their emission reduction

targets under the KP. This mechanism can stimulate sustainable development and emission reductions, and give industrialized countries some flexibility in how they meet their emission reduction limitation targets as well.

Since the CDM allows emission-reduction projects in developing countries to earn certified emission reduction (CER) credits and sell CERs to the developed countries, developing nations can take advantage of this mechanism easily. A report by the Ministry of State for Environment and Forest, India, revealed that as of August 10 2010, out of the total 2313 registered CDM projects with the UNFCCC, 520 CDM projects got registered from India, which have the potential to generate 43 million CERs per annum that amount to approximately 12% of the total annual CERs generated by registered CDM projects globally. Now India's target is to achieve greater economic development, and therefore, its present concern is to switch over from agricultural dependency to industrialization. The problem is that a major portion of its total population still depends directly or indirectly on agriculture or agriculture based activities and this scenario does not match with the economic progress of the other developed countries like the US, France, Britain, Germany, Italy, Spain etc. But even then, India has a huge possibility to share a major portion of the global CDM projects as it stays below the maximum limit of carbon emission. Therefore, initiatives are to be taken. Fortunately, India has recently shown its willingness to participate in the international mitigation process of GHGs and carbon trading to give its own economy a boost. The National Action Plan adopted by the Indian government for increasing the usage of cleaner sources of energy is surely a positive step in this regard.

Accordingly, this paper aims at examining the concepts of carbon credit and carbon trading and their effects on Indian economy, their growth, future requirements and scope in India and hence making suggestions suitable for new business opportunities. The remainder of the paper is organized as follows. *Section 2* sketches the concepts of carbon credit and carbon trading. *Section 3* outlines the present Indian scenario relating to carbon credit and carbon trading. *Section 4* deals with the future prospects of carbon trading in India, while with conclusion in *section 5,* this paper completes the study of carbon credit and carbon trading from India's perspective.

2. Carbon Credit and Carbon Trading

This section discusses the concept of carbon credit and establishes the linkage between carbon credit and carbon trading through a hypothetical example.

The concept of carbon credits has been introduced in pursuance of an international policy to control GHG emission in environment. Carbon credit refers to the legal tradable certificates that permit the right to emit one ton of carbon or carbon dioxide equivalent. Credits are awarded to countries that have reduced their green house gases below their emission quota. Carbon credits can be traded in the international market at the prevailing market price. It helps in forming a strategic mindset that can influence industrial and commercial houses towards low carbon emissions into atmosphere and take advantage of carbon trading to sell their excess credits. Thus GHG control mechanism gives birth to carbon trading that can successfully encourage carbon reduction schemes among different industries and thus the concept of emitting carbon below the emission quota certainly helps many companies who are willing to sell excess carbon credits to commercial and individual customers. Industries can exchange, buy or sell carbon credits in national and international markets at the prevailing market price. According to a recent study report, India and China seem to emerge as the biggest sellers and Europe as the biggest buyer of carbon credits in near future. A company can reduce carbon emission by following new eco-friendly technologies which in return may help them to earn carbon credits. Developing nations --- India, China and some other Asian countries are now taking advantage of this process by joining into the United Nations Framework Convention on Climate Change. But the most important thing to be kept in mind is, whatever be the industry or wherever the industry is situated, if it comes under the KP's restriction, then it should take all possible measures to control the GHG emissions within the possible limits. If unable to do so, then it can purchase carbon credits through carbon trading.

So carbon trading refers to the means of generating income through sale of carbon credits. It generally helps the countries or industries which cross its maximum limits of carbon emission and need further carbon credits. Such industry(s) or country(s) can take advantage of carbon trading to buy extra units of CERs or carbon credits from the countries or industries that have already saved carbon credits in their pocket by emitting carbon below their maximum quota of carbon emission. Thus, carbon trading offers the facility of meeting the demand and supply gap of carbon credits. A simple example in this context will make the whole process more clear and understandable. For example, if country 'U's required carbon emission limit is 10 units and at price 'R' its production of carbon emission is 5 units, then it would have extra 5 units of carbon emission to sell. Now, at the same time if country 'P's generation of carbon emission at the same price exceeds its maximum level of carbon emission by 5 units, then through carbon trading country 'P' can purchase those required extra 5 units from country 'U' in exchange of the prevailing market price. Thus, this process of carbon trading helps to reduce the total amount of carbon emission, making it profitable for both the concerned parties involved in such trading. Thus India, being a developing nation, can benefit from carbon credit and its trading in the following way:

- firstly, money from carbon credits generated through carbon trading can profitably be used to create renewable energy projects;
- secondly, energy saving initiatives can also be taken by proper usages of carbon credits, and
- thirdly, the advantages of carbon credits can also be seen in terms of generating employment for the people by setting up of industries which will engage in manufacturing of renewable energy products.

3. Present Scenario of Carbon Credit and Carbon Trading in India

It becomes imperative at this stage to examine the carbon credit and carbon trading arrangements prevailing in India presently. For the said purpose, this section is segmented into two parts— part (a) deals with the emergence and scope of carbon credit in India while the present Indian trends in carbon trading are discussed in part (b).

(a) Emergence and Scope of Carbon Credit in India

India belongs to the third category of signatories to UNFCCC. India signed and ratified the Protocol in August, 2002. Being a developing nation, India specifically belongs to Non-Annex category of countries of the KP and hence has taken initiatives in exploring the benefits of the CDM notably. According to a report on National Action Plan for operating CDM by the Planning Commission of India, India's total CO_2-equivalent emissions in 1990 were 10,01,352 Giga grams, which was nearly 3% of total global emissions at that time. The matter of concern is that, the more the deadline for meeting the KP targets becomes nearer for the first phase i.e. (2008-2012), the more the CER prices are expected to rise, as countries/companies become more interested in saving carbon credits to meet their future targets. Therefore, to take advantage of this situation India has to think of reducing its carbon emission further to save more carbon credits so as to indulge in carbon trading business more effectively. Being a non-Annex I country, India has already become successful in operating CDM. As per the report of the Prime Minister's Council on Climate Change, India has given host-country approval for 969 CDM projects as of June, 2008 and which included projects from renewable sector mainly. The 969 projects included 553 renewable biomass projects, 303 energy efficiency projects along with 6 forestry projects and 18 municipal solid waste projects. India now has two commodity exchanges trading in carbon credits namely, the

Multi Commodity Exchange (MCX) and the National Commodity and Derivatives Exchange (NCDEX). This means that Indian Companies can now get a better trading platform and price for CERs generated. The MCX is the largest commodity exchange in India and has launched futures trading in carbon credits in January, 2008. This initiative made it to be Asia's first-ever commodity exchange to offer trades in carbon credits. The NCDEX also followed the same path and started futures contract in carbon trading on and from 11th April, 2008. All these initiatives have made carbon trading a great business opportunity for India. Foreign companies which cannot fulfil the KP norms, can buy the extra required credits from Indian companies. Many national and international companies have already started investing into this business regime. As for example, SRF Ltd, Shell Trading International, Suzlon Energy and Shriram EPC, Shree Renuka Sugars etc. are all expected to derive benefit from saving carbon credits. Many Indian companies have started finding higher incomes in carbon credits than that from their nucleus businesses. Indian companies are getting interested in making eco-friendly projects to earn carbon credits. Due to the rapid growth in renewable energy projects, India's revenue from such projects is expected to rise largely. According to a survey conducted by Crisil, Indian RE projects are estimated to receive 246 million CERs by December, 2012. This will probably ensure India's second position in the global CER market as regards the volume of CER issuance and the number of projects registered with UNFCCC.

(b) Present Scenario of Carbon Trading and its Legal Aspects

A recent report of the World Bank conveys that India can be one of the largest beneficiaries of carbon trading as it controls almost 20-25 percent of the world carbon trade presently. Many developed as well as developing countries like the US, Germany, Japan and China are likely to be the biggest buyers of carbon credits and it is likely to be beneficial for India. Data collected from the report entitled *"Future of CDM Projects"* by Amulya Charan, chief mentor of TATA Power, suggests that India's dominance in carbon trading business is increasing day by day. The report reveals that till 2012, the total number of Indian CDM projects registered with UNFCCC is 942 and out of which 141 projects have got registered in the year 2012 and the number of CDM projects got registered during 2011, 2010, 2009, 2008 were 189, 138, 92, 84 respectively. Moreover, there are 104 CDM projects in pipeline and with all these India stands 2nd in terms of registered CDM projects with the UNFCCC presently. On the other hand, India's average annual CERs are presently expected to be approximately 12.6% of the global CERs. It certainly helps Indian industries to take part in the rapid growth of the carbon market. It is expected that India's gross earnings from carbon trading will be around Rs 22,500 crore to Rs 45,000 crore in the coming

3-5 years. India's carbon trading market bagged the second highest transacted volumes in the world by generating 30 million carbon credits in recent past. The carbon trading market in India is growing faster than even IT and other service industries. In the light of the above discussions, a few carbon trading companies/centres presently operating in India are listed in Exhibit 1 below.

Exhibit 1: A Few Carbon Trading Companies in India

Name of the Companies/Centres	Special Features
Jindal Vijaynagar Steel	Expected sale in next ten years is$225 million worth of saved carbon.
Powerguda in Andhra Pradesh	Currently selling 147 tonnes equivalent of saved carbon dioxide credits.
Handia Forest in Madhya Pradesh	Earn at least US$300,000 every year from carbon payments by restoring 10,000 hectares of degraded community forests.
Torrent Power AEC	Estimated amount receivable from 'Energy Efficiency Project' is Rs. 199.9 crore.
Indian Aluminium	Estimated amount receivable from 'Gas Capture Project' is Rs. 42.9 crore.
Kalpataru Power Transmission	Estimated amount receivable from 'Renewable Project' is Rs. 5.3 crore.
Grasim Industries	Estimated amount from 'Energy Efficiency Project' is Rs. 4.1 crore.
Balrampur Chini	Estimated amount receivable from 'Renewable Project' is Rs. 15.7 crore.

With two commodity exchanges, namely MCX and NCDEX, operating in carbon trading, India can bring greater transparency in the market operations and help the producers earn revenue out of carbon credit projects easily. But the dismal picture is that India is yet to develop a proper and standardized trading policy for carbon credits. As a result, the amount of foreign exchanges that could have been earned by selling carbon credits to foreign buyers in recent past has not materialized as expected. Moreover, foreign exchange generation through carbon trading is restricted in India in some cases as some international buyers (e.g. European market buyers) are not allowed to take part in the Indian carbon trading market. It also hinders the Indian market from earning its expected revenues. Fortunately, Indian government has understood this problem and has taken steps to widen the market for carbon trading. Accordingly, Forward Contracts (Regulation) Amendment Bill has been passed in the Parliament on 2nd October, 2010. This amendment is expected to widen and open the Indian carbon market further in the near future and help the traders utilize NCDEX as a platform for trading of carbon credits more significantly.

4. Future Prospect of Carbon Trading in India

As one of the leading generators of CERs through CDM, India has a shining future in carbon emissions trading. Corporate participation seems to be increasing in carbon emissions trading in India also. Companies like Tata, Reliance, Ambuja, Birla, Bajaj and many others, are willing to earn some returns through CDM. This sudden growth in the carbon trading market has generated interests among the international carbon credit buyers to involve in India's carbon trading market. Days are not far when "carbon" would be considered as one of the most profitable commodities to be traded nationally or internationally. Now, there are two main concerns of the Indian industries and which must be settled immediately to reap profit in future: a) how carbon emissions can be reduced to gain more carbon credits? and b) how should these be accounted for? Companies are also facing difficulties in showing earnings from carbon trading in their taxable income statement as there is no specific head of income under which it should be considered. Therefore, most Indian companies show the earnings out of carbon credit trading as 'other income'. Only if the above mentioned issues get settled, India can derive the following benefits from carbon trading in near future:

- India can gain technological improvements as the World Bank in association with the Infrastructure Development Finance Company (IDFC) is likely to handle the carbon finance projects in the country;
- carbon trading will contribute to the GHG reduction projects by enabling India to adopt alternative sources of energy, and
- Indian companies can make profits by selling the CERs to the developed countries, and for encouraging them the IDBI has set up a Carbon Credit Desk (CCD), which is responsible for providing all the necessary services to promote CDM.

5. Conclusion

With growing consciousness among nations to limit industrial GHG pollution together with positive industrial growth, the emission trading seems to be the main area of business attraction today. Because of the continuous ratifications of the KP, carbon trading business is likely to emerge as the most profitable business of the modern world. The recent rise in carbon credit and its trading activities in developing countries like China, India etc. is an indication of how this industry is going to be successful in the years to come. Carbon trading occupies the fastest growing financial market in the world economy presently. As a developing nation, India has a large potential for GHG reduction and carbon trading business. According to the World Bank review, the market for carbon trading in India is emerging strongly in spite of various economic and non-economic limitations. In 2007, India pursed carbon trade valuing at US $64 billion and stood at the second position in the CDM project by capturing 6% market share. India ranks as the fourth largest emitter of GHGs in the world today. Its per capita emission of GHG is 1.2 tons per year. Though satisfactory, yet if India wants to realize its future target of economic growth and accelerate it further through carbon trading, it has to work hard. Therefore, proper policies need to be formulated and implemented to hold GHG emission in check to save more carbon credits to increase the volume of carbon trading.

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➢ **Book**

Choi, F.D.S. and Mueller, G.C. (1984), *International Accounting*, Prentice Hall, New Jersey, 742-779.

➢ **Paper in Journal**

Spencer, M.H. (1963), Axiomatic Method and Accounting Science, *The Accounting Review*, 10 (3), May, 29-42.

➢ **URLs**

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